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January 1980

DATA DOCUMENTATION FOR THE BARE SOIL EXPERIMENT AT THE UNIVERSITY OF ARKANSAS

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Gary D. Hancock, William P. Waite and Hubert D. Scott
University of Arkansas
Department of Electrical Engineering
Fayetteville, Arkansas 72701

Lyndon B. Johnson Space Center
Houston, Texas 77058

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16. Abstract

The 1979 bare soil experiment at the University of Arkansas was conducted from July through October and investigated the reflectivities of several controlled moisture test plots. These test plots were of a similar soil texture which was clay loam and were prepared to give a desired initial soil moisture and density profile. Measurements were conducted on the plots as the soil water redistributed for both long term and diurnal cycles. These measurements included reflectivity, gravimetric and volumetric soil moisture, soil moisture potential, and soil temperature.

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ABSTRACT

The 1979 bare soil experiment at the University of Arkansas was conducted from July through October and investigated the reflectivities of several controlled moisture test plots. These test plots were of a similar soil texture which was clay loam and were prepared to give a desired initial soil moisture and density profile. Measurements were conducted on the plots as the soil water redistributed for both long term and diurnal cycles. These measurements included reflectivity, gravimetric and volumetric soil moisture, soil moisture potential, and soil temperature.

1.0 INTRODUCTION

Recent laboratory and field measurements conducted at the University of Arkansas dealing with layered media indicated that the reflectivity of the soil was not only a function of its texture and moisture but the density of the soil. These observations gave the impetus for the 1979 Bare Soil Experiment which was to investigate under field conditions the changes in reflectivity of similar textured soils with controlled initial moisture and density profiles for both diurnal and long term cycles.

The experiment took place over the period from July 9 to October 19, 1979 at the University of Arkansas Agricultural Experiment Station #1 with the cooperation of the Agronomy Department. Measurements of the experiment that coincided with those of the reflectivity were soil moisture profile, bulk density profile, soil moisture potential profile, soil temperature profile, and air temperature. These measurements will be used to determine the sensitivity of the reflectivity to soil moisture and density as well as to provide a data base to duplicate the field experiment using a multilayer coherent reflectivity model.

This report states the methods used for test plot preparation, obtainment of reflectivity and ground truth data, and presents the data of the experiment.

2.0 TEST PLOT DESCRIPTION AND PREPARATION

As previously stated the location of the experiment was the University of Arkansas Agricultural Experimental Station #1. The choice of this site allowed for accessibility and provided soils of a common texture which was clay loam.

Two different test plot areas at the site were employed for the experiment. These two areas were separated by a distance of 25 meters and lay adjacent to a wheat field. Because of the plot areas position with respect to each other, a designation of north plot and south plot was used to differentiate between them.

2.1 INITIAL PLOT PREPARATION

Initial plot preparation consisted of tilling a plot area and boxing a portion of the area with a 4.57 by 4.57 meter wooden frame. This wooden frame was constructed of 2.5 by 30 centimeter pine boards. The boards of the frame were placed into the soil to a depth of approximately 20 centimeters leaving 10 centimeters of the board above the soil surface. Framing a plot in this manner clearly designated the plot area, aided in plot irrigation and levelling, and confined the soil moisture redistribution to a specific area.

2.2 TEST PLOT CYCLE DESIGNATION AND DURATION

The period of the experiment encompassed the span of time from July 9 to October 1[illegible], 1979. This period was divided into five separate time intervals in which each time interval marked a different test plot cycle. A numerical designation references each test plot cycle in order to show the time interval of measurement. A listing of the test plot numbers, time intervals and plot locations is given in Table 1.

TABLE 1. PLOT CYCLE DESIGNATION AND DURATION

Plot #	Start Date	End Date	Plot Location
1	7/9	7/30	North
2	8/6	8/14	South
3	8/21	9/4	South
4	9/6	9/19	South
5	9/21	10/19	South

2.3 FINAL PLOT PREPARATION

Final plot preparation included plot irrigation, retilling and levelling as required by the objectives of the experiment for a particular initial soil moisture content and density. The following paragraphs give a brief description of the final cultivation of the individual test plot cycles.

The final preparation of test plot 1 gave it an appearance similar to that of a very weathered bare field. The procedure that achieved this began June 30, 1979 with the retilling and levelling of the soil. This cultivation was followed with periodic irrigation over the interval prior to initiation of plot measurements on the morning of July 9. The irrigation process involved flooding the soil plot to attain a saturated condition and then allowing the water to infiltrate into the soil. During this interval of periodic irrigation, an amount of approximately 6.85 centimeters of rain fell upon the plot surface. The combination of the irrigation process and rainfall dramatically aided in the smoothing and compaction of the soil giving the plot its weathered appearance and large initial moisture content.

The goal of the experiment after the termination of plot #1 was to achieve test plots with a loose upper soil horizon of at least 15 centimeters in depth. This objective stemmed from the desire to observe test plots that simulated freshly cultivated fields as an initial condition as they were weathered by the environment.

Previous experience with plot 1 showed that flooding the plot to gain a saturated condition destroyed the surface roughness structures and compacted the soil. Using a sprinkler system for irrigation tended to have the same effects as flooding but less dramatically in that this system caused local flooding in the plot. This local flooding caused non-uniform soil roughness structures and densities over the plot area: both undesired conditions.

The method used to gain the desired results was to till and level the test plot, irrigate using a sprinkler system, allow the moisture to redistribute for an appropriate period of time, and retill and level. This final tilling loosened the soil, gave a uniform initial soil content in the tilled horizon, and re-established the soil surface roughness structure.

The above procedure was followed for the final of plots 2, 3, and 4. Each plot with the exception of plot 2 was given a higher initial moisture content than its predecessor by successively increasing the amount of irrigation and decreasing the time allowed for moisture redistribution before retilling. Varying the cultivation in this manner not only gave increased surface moisture but also gave increases in the density of the tilled horizon and larger soil surface structures.

Test plot 5 was simply a continuation of plot 4. A rain event marked the time interval change to the new plot. No steps were taken to artificially change the initial conditions of the plot because the objective for this plot was to observe the long effects of natural weathering.

3.0 EXPERIMENT INSTRUMENTATION

Immediately after the completion of final plot preparation the plot under test was instrumented as shown in Figure 1. Instrumentation included a bistatic reflectometer for soil reflectivity measurement, tensiometers for soil moisture potential estimation, and a data logger with thermocouples and humidity sensors for the determination of soil temperature profiles, air temperature, and humidity.

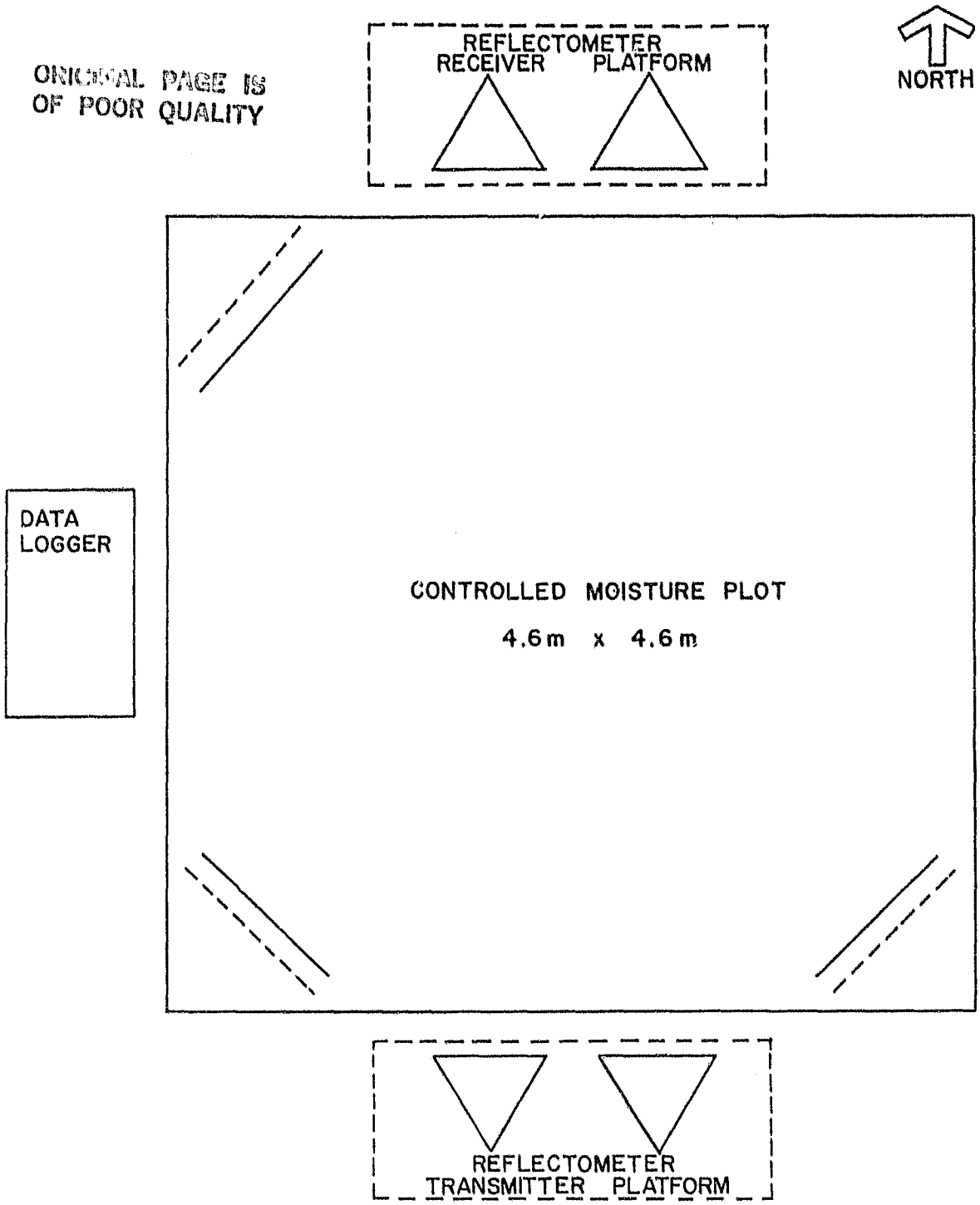

FIGURE 1. INSTRUMENTATION DIAGRAM FOR BOTH NORTH AND SOUTH PLOTS OF THE 1979 BARE SOIL EXPERIMENT AT THE UNIVERSITY OF ARKANSAS

3.1 BISTATIC REFLECTOMETER INSTRUMENTATION

The reflectivity data was gathered utilizing a bistatic reflectometer system measuring at the specular angle of 45^{o}. This reflectometer system featured separate antenna support platforms of the same construction for both the transmit and receive portions of the device. The system also featured dual standard gain horn antennas for the bandwidths of 1 to 2 Ghz and 4 to 8 Ghz. A 1 to 2 Ghz and a 4 to 8 Ghz antenna was mounted on each antenna support platform in a parallel side by side arrangement. The transmitter portion of the system consisted of a microwave sweep oscillator mainframe with indivdaul sweep plug-ins for the 1 to 2 and 4 to 8 Ghz bandwidths. Receiver implementation was accomplished by using a network analyzer as a ratiometer and an X-Y plotter to furnish a permanent record of the data. Table 2 gives a listing of the reflectometer parameters used in the system, and Figure 2 shows a block diagram with system cable interconnects.

System calibration was external and employed a thin sheet of aluminum. The calibration procedure involved placing the aluminum sheet over the soil area to be illuminated and making a swept frequency measurement of the power reflected from the aluminum sheet. After the removal of the aluminum calibration plate, a swept frequency measurement of the reflected power from the bare soil was made. The ratio of these two swept frequency measurements eliminates system parameters and gives the reflectivity of the bare soil. A more detailed description of a bistatic reflectometer using this calibration procedure is given in Waite, et.al., 1973.

An Alfred 8000/7051 sweep network analyzer was initially used in the experiment. This network analyzer required the recording of the individual X-Y plots of the reflected power for the aluminum sheet calibration and the bare soil measurements from which the soil reflectivity was reduced by hand.

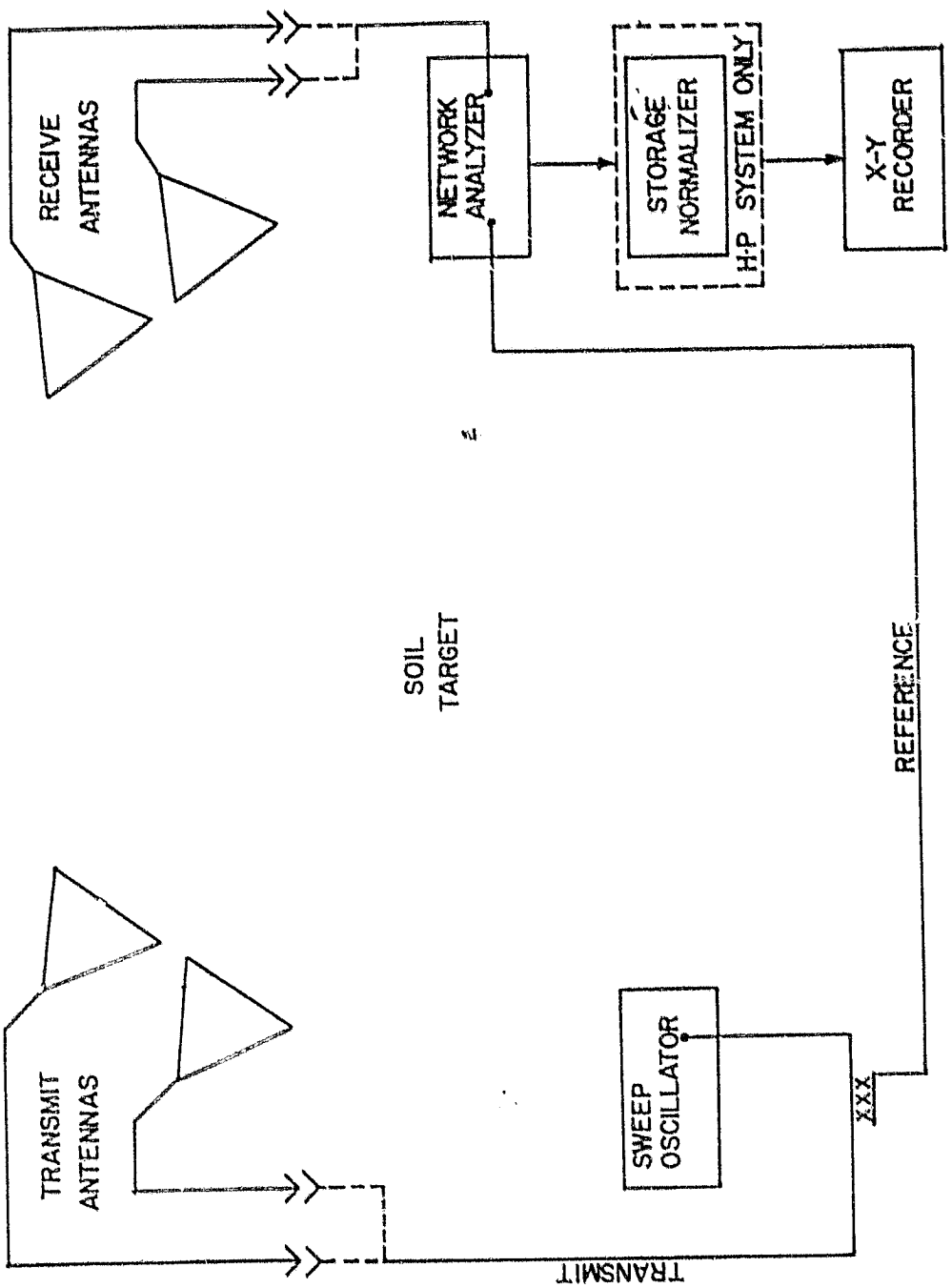

FIGURE 2. BLOCK DIAGRAM OF BISTATIC REFLECTOMETER INSTRUMENTATION

TABLE 2. BISTATIC REFLECTOMETER SYSTEM PARAMETERS

Incidence Angle: 45^{o}
Slant Range: 3.75m

Antennas:

Type: Standard Gain Horn
Mounting: Dual Bistatic
Polarization: HH

Operation:

Type: FM-CW
Bandwidths: 1-2 Ghz, 4-8 Ghz
Frequency Sweep: Continuous over the bandwidths

External Calibration: Aluminum plate

This instrument was replaced at the beginning of plot 3 by an H-P network analyzer system that included a storage normalizer unit.

The addition of this storage normalizer brought to the system the capability to store and to ratio the calibration measurement with the bare soil measurement giving the soil reflectivity in a direct manner for recording. An example of the recorded output of the Alfred Network analyzer taken from the data of plot 2 is shown in Figure 3, and an example of the output of the H-P network analyzer system taken from the data of plot 3 is given in Figure 4.

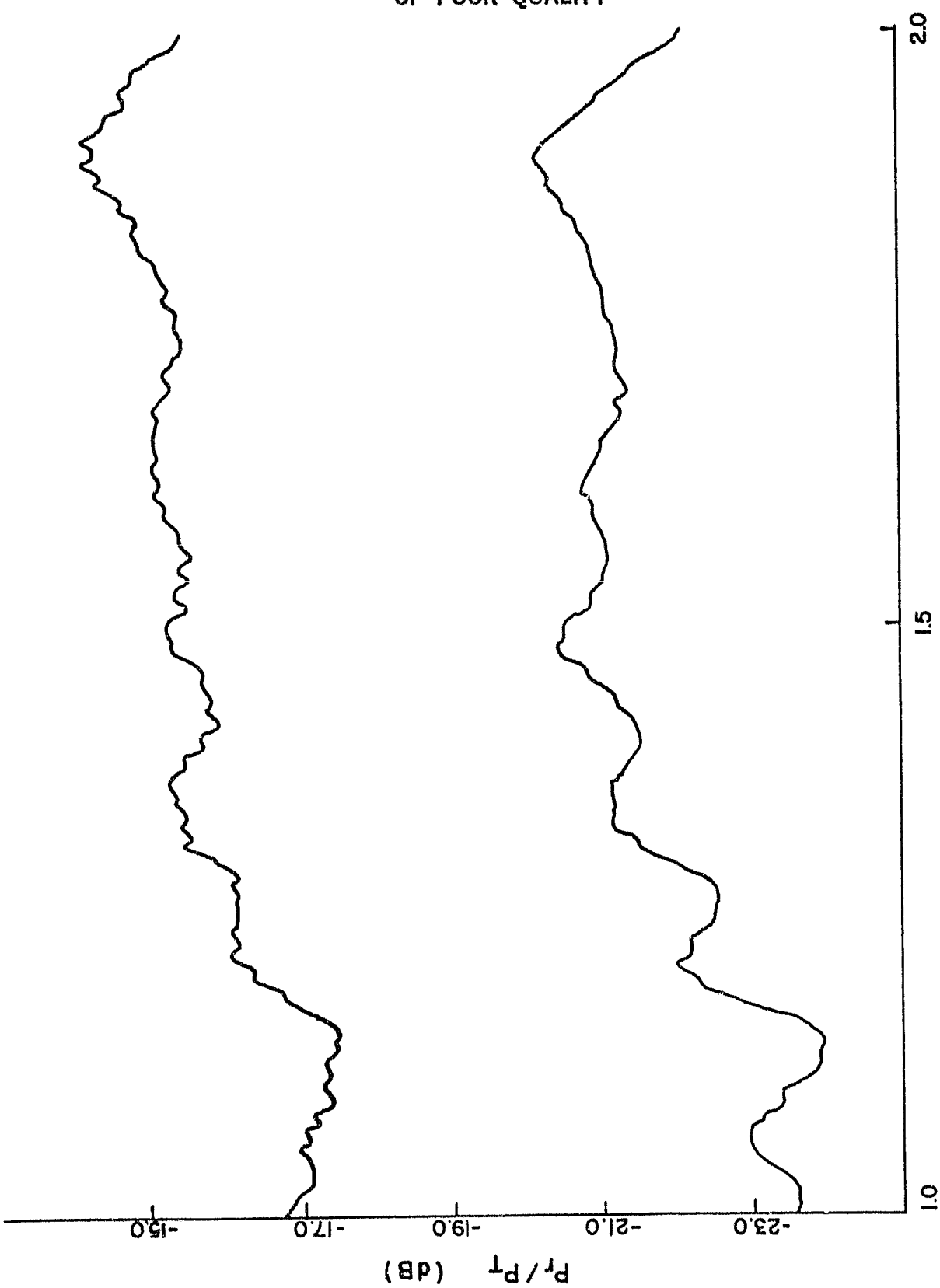

FIGURE 3. EXAMPLE OF THE RECORDED OUTPUT OF THE ALFRED NETWORK ANALYZER SYSTEM TAKEN FROM THE DATA OF PLOT 2.

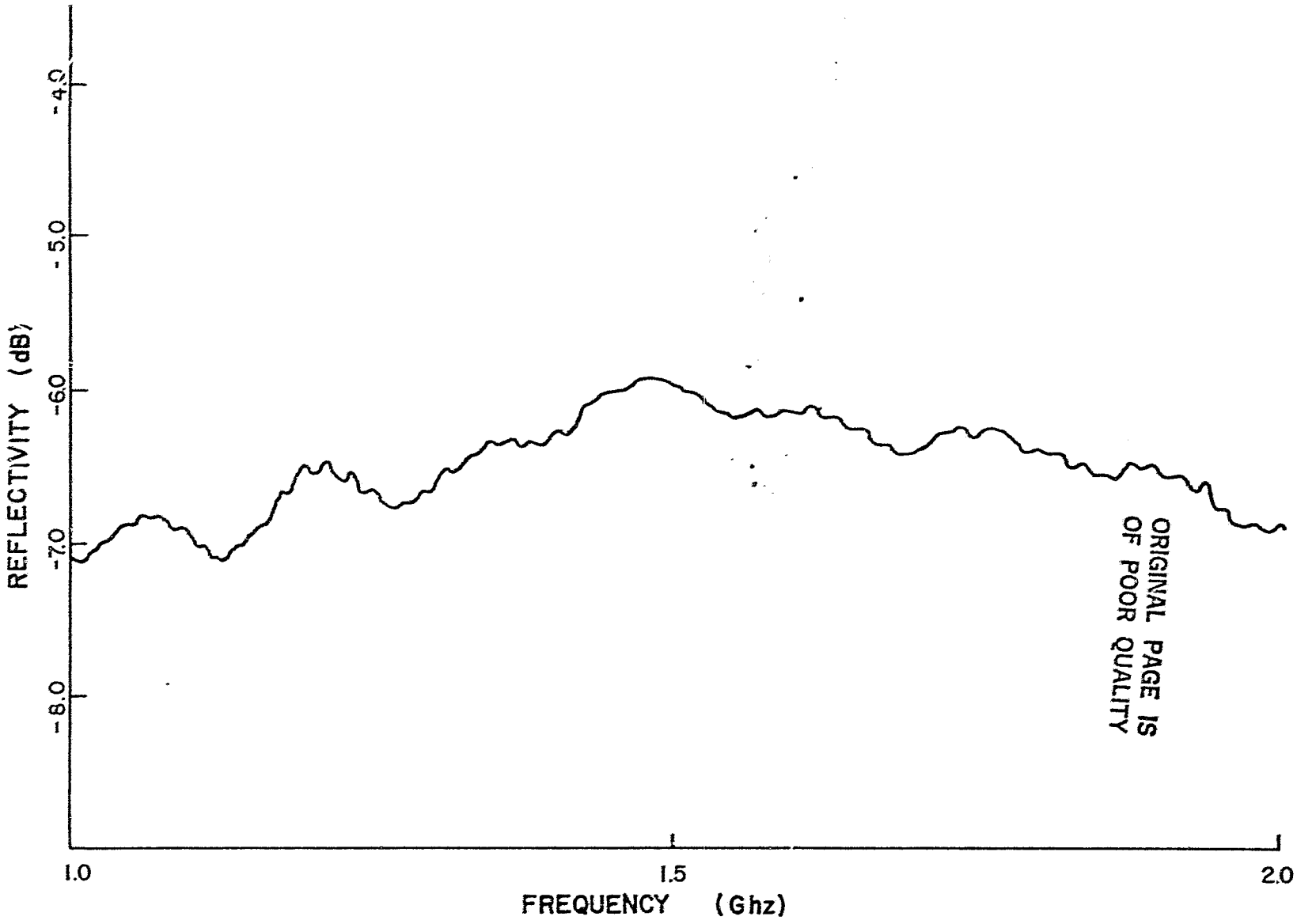

Figure 4. EXAMPLE OF THE RECORDED OUTPUT OF THE HEWLETT-PACKARD NETWORK ANALYZER TAKEN FROM THE DATA OF PLOT 3.

3.2 TENSIOMETER INSTRUMENTATION

The tensiometer is a device for measuring soil moisture potential. The devices used in this experiment consisted of a porous ceramic membrane connected to a simple mercury manometer by a plastic tube filled with water.

Each soil test plot employed three banks of tensiometers placed about the plot as shown in Figure 1. Each tensiometer in a bank was placed at different depths in the soil to give a soil moisture potential profile. The depths of the soil at which the tensiometers were placed are given in Table 3. At the present time the tensiometer data is under review and not included in this document.

TABLE 3. TEMPERATURE AND SOIL MOISTURE POTENTIAL INSTRUMENTATION

Measurement	Device	# of Banks	# per Bank	Interval (cm)
Soil Temperature	Thermocouple	3	8	1, 2, 3, 4, 5, 10, 24, 30
Air Temperature	Thermocouple	3	2	30, 150 (above soil surface)
Soil Moisture Potential	Tensiometer	3	8	1, 2, 3, 4, 5, 10, 24, 30

3.3 TEMPERATURE AND HUMIDITY INSTRUMENTATION

Another objective of the experiment was to monitor the air and soil temperatures on a continuing basis. This goal was achieved by deploying thermocouples about the plot and using a data logger to sense and record the thermocouple voltages.

The plot arrangement of the thermocouples was similar to that of the tensiometers in that three banks of thermocouples were employed. The locations of the thermocouple banks coincided with that of the tensiometer banks as shown in Figure 1. Each bank contained a total of ten thermocouples. Two of these thermocouples were positioned above the soil surface for air temperature measurements and the remaining eight thermocouples were placed at various depths in the soil to give a soil temperature profile. Table 3 provides a summary of the thermocouple placement.

In order to provide a minimum of disturbance to soil structure, a specially designed device was constructed to place the thermocouples in the soil. This tool employed a slant angle method of insertion to gain the desired vertical depth.

The data logger used to measure the thermocouple voltages was a multifunctional instrument that could be preset to record at specific intervals on a twenty-four hour basis. Besides thermal measurements, the data logger coupled with special sensors also measured relative humidity, but these humidity sensors failed during the course of plot 2 and could not be replaced before the end of the experiment. Although the humidity data is available, it is not included in this document since it does not cover the majority of the experiment.

4.0 EXPERIMENT DATA

Measurements of the experiment included soil reflectivity, soil moisture content, bulk density, air temperature, soil temperature, soil moisture potential, relative humidity, and rainfall. All of these measurements were made in conjunction with that of the reflectivity. A record giving the dates and times of the reflectivity measurements is presented in Appendix A. The following narratives present the individual datum of the measurements for the experiment.

4.1 RAINFALL DATA

The rainfall datum was collected daily at 0800 at a weather station located approximately one kilometer from the test site. Figure 5 is a graph of the significant rainfall during the summer and graphically indicates that the summer was unusually wet. A summary of the rainfall data is given in Appendix B.

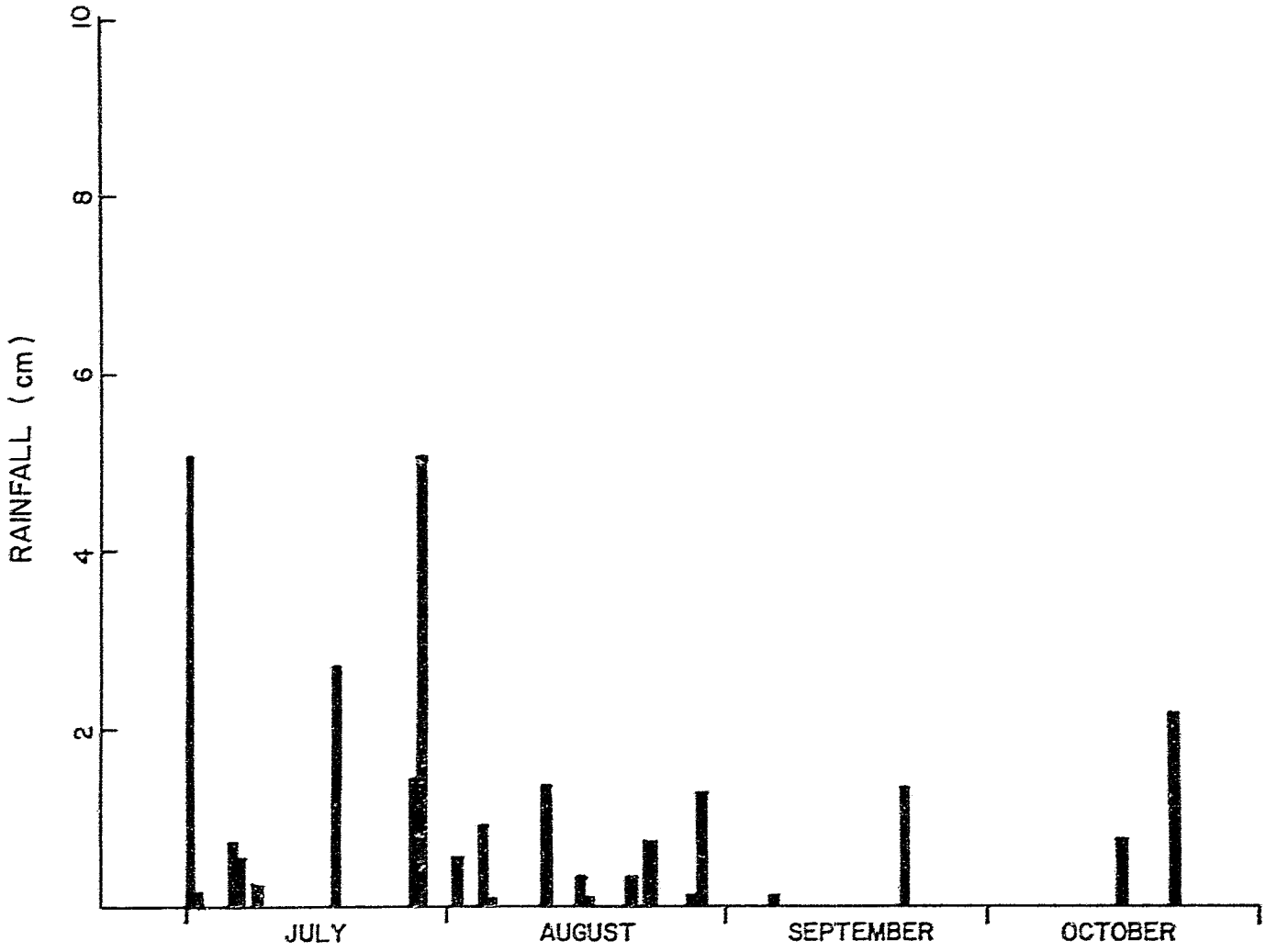

FIGURE 5. GRAPH OF THE SIGNIFICANT RAINFALL DURING THE SUMMER OF 1979

4.2 REFLECTIVITY DATA

The reflectivity data of the experiment are presented in Appendix C. Figures 6 through 10 show the daily and long term variations of the reflectivity at 1.25 Ghz for the five plots, whereas Figures 11 through 15 give the same for the reflectivity at 6 Ghz.

In order to meet the objectives of conducting measurements for diurnal and long term time periods, the frequency of the measurements for the initial three plots had the following schedule. At the start of each of these three plots the rate of measurement was three per day: morning, solar noon, and afternoon. As the soil moisture redistributed, the solar noon measurement was eliminated leaving the rate at two a day. The rate was further reduced to only the afternoon measurement as the test plot cycle moved into a long term measurement interval.

The primary goal for the remaining two plots was to monitor the soil over a long term period at a reduced rate of measurement. The regiment for plot 4 was to initially make at least one afternoon measurement a day, accomplish a diurnal experiment, and then reduce measurements to one every other day. With the rainfall event of August 20, test plot 4 was redesignated plot 5, and the rate of measurement further reduced to two per week. Measurements of the experiment were terminated October 19 giving a total measurement span of 43 days for plots 4 and 5.

Another objective of the experiment was to observe any coherent multilayer effects in the reflectivity data. No significant multilayer effects were seen in any of the 1 to 2 Ghz reflectivity data, but all of the plots with the exception of plot 1 show multilayer effects in the 4 to 8 Ghz bandwidth reflectivity data. Figures 16 through 19 give examples of these

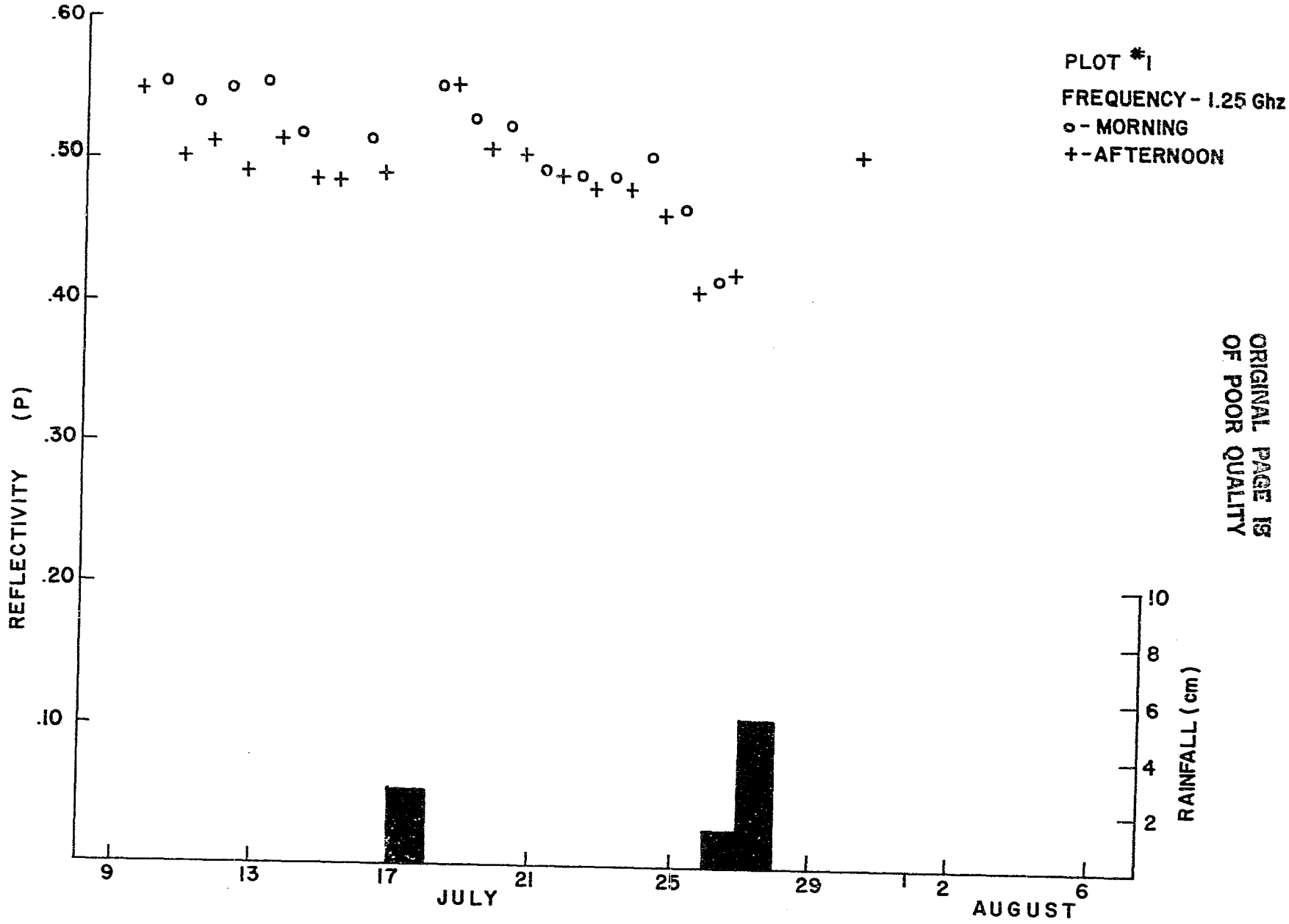

FIGURE 6. 1.25Ghz REFLECTIVITY vs. TIME FOR PLOT 1

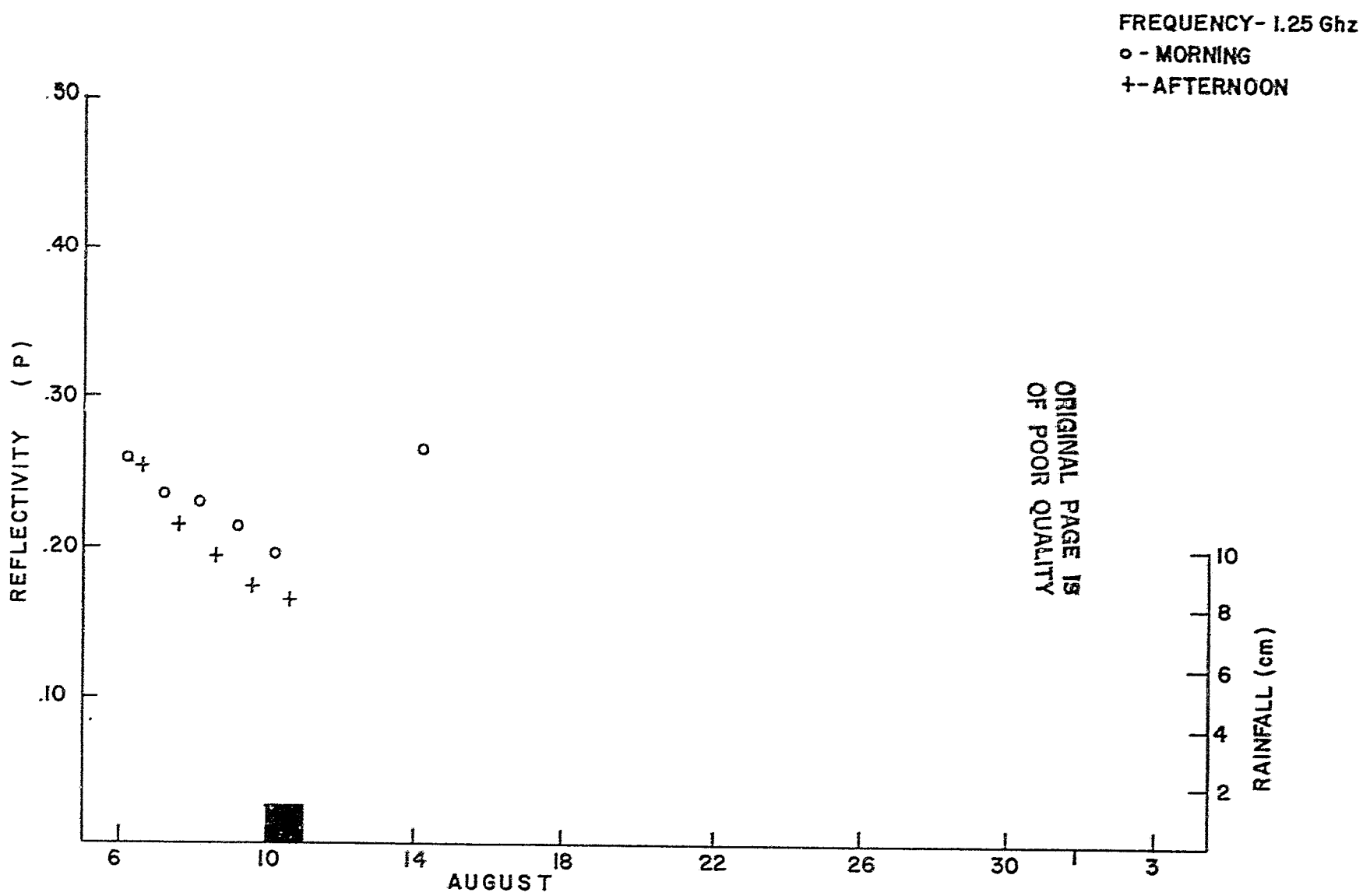

FIGURE 7. 1.25 Ghz REFLECTIVITY vs. TIME FOR PLOT 2

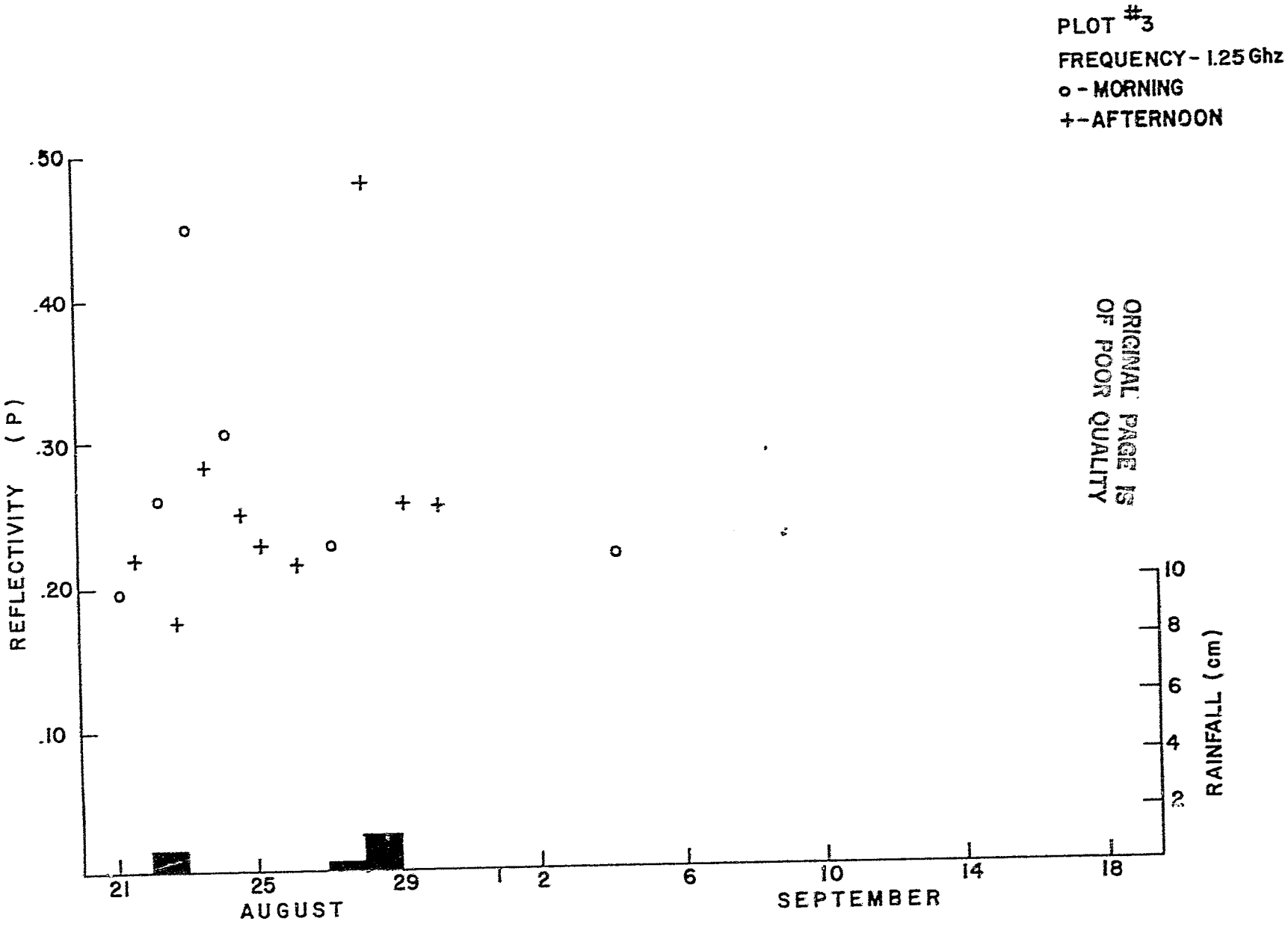

FIGURE 8. 1.25 Ghz REFLECTIVITY vs. TIME FOR PLOT 2

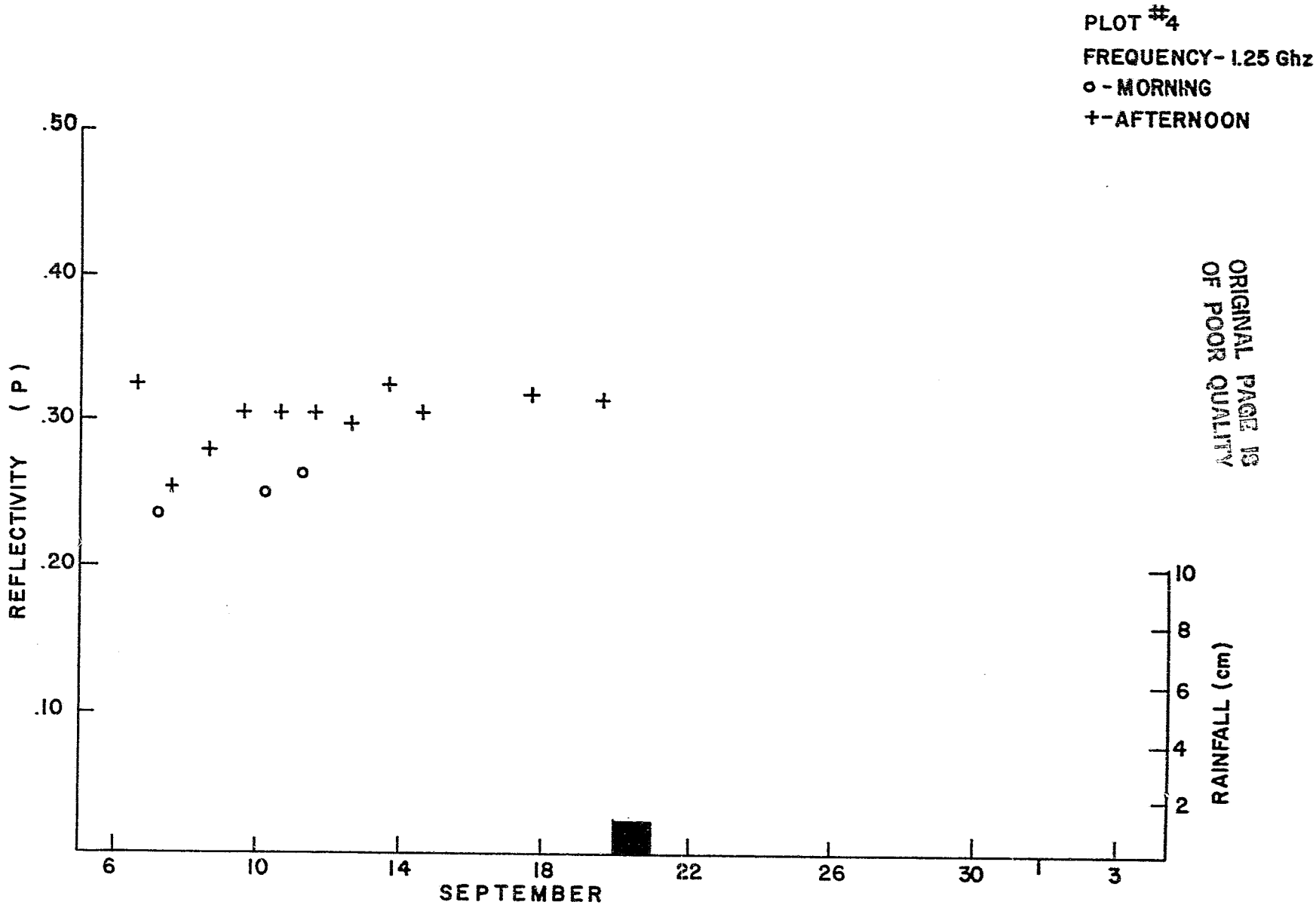

FIGURE 9. 1.25 Ghz REFLECTIVITY vs. TIME FOR PLOT 4

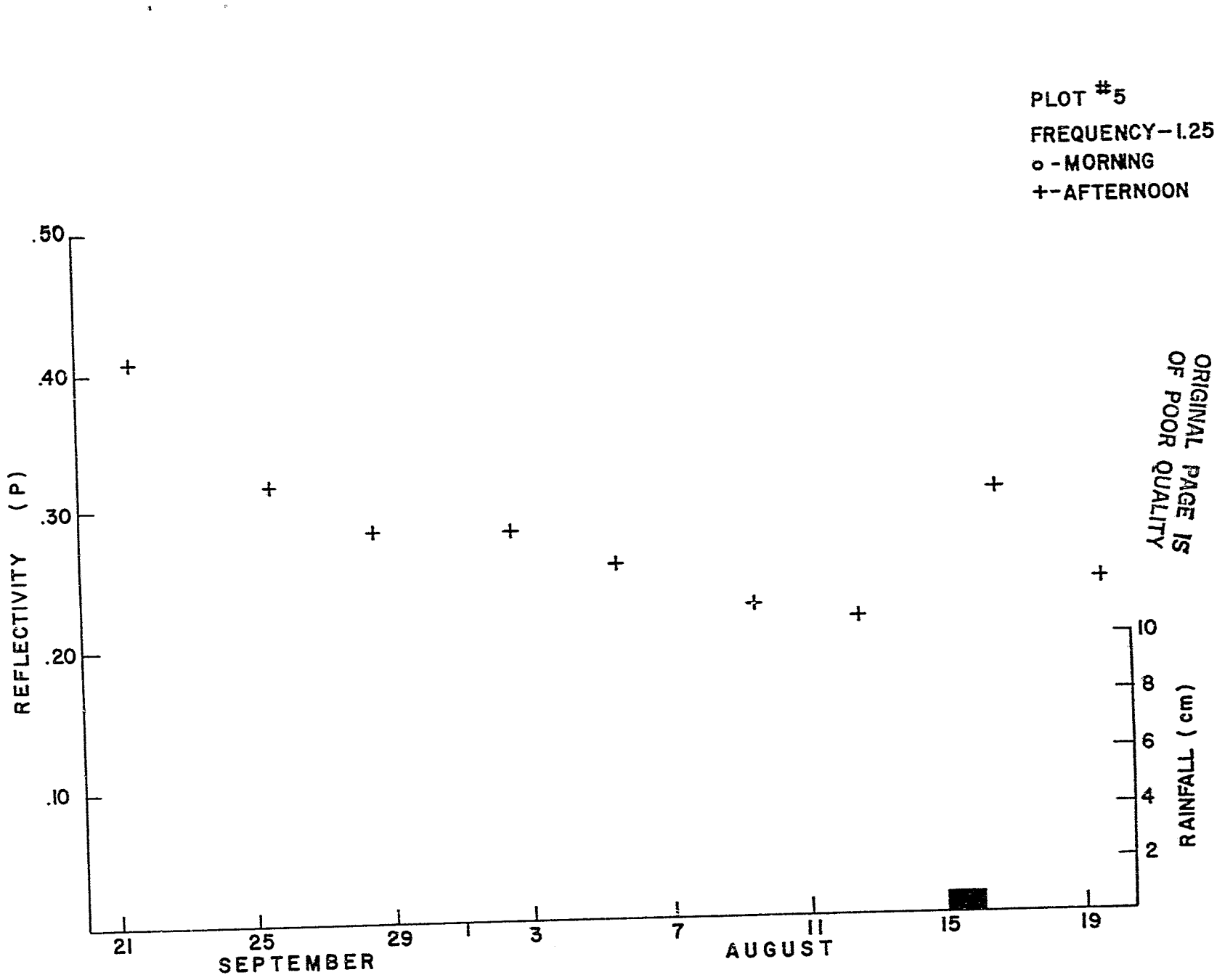

FIGURE 10. 1.25 Ghz REFLECTIVITY vs. TIME FOR PLOT 5

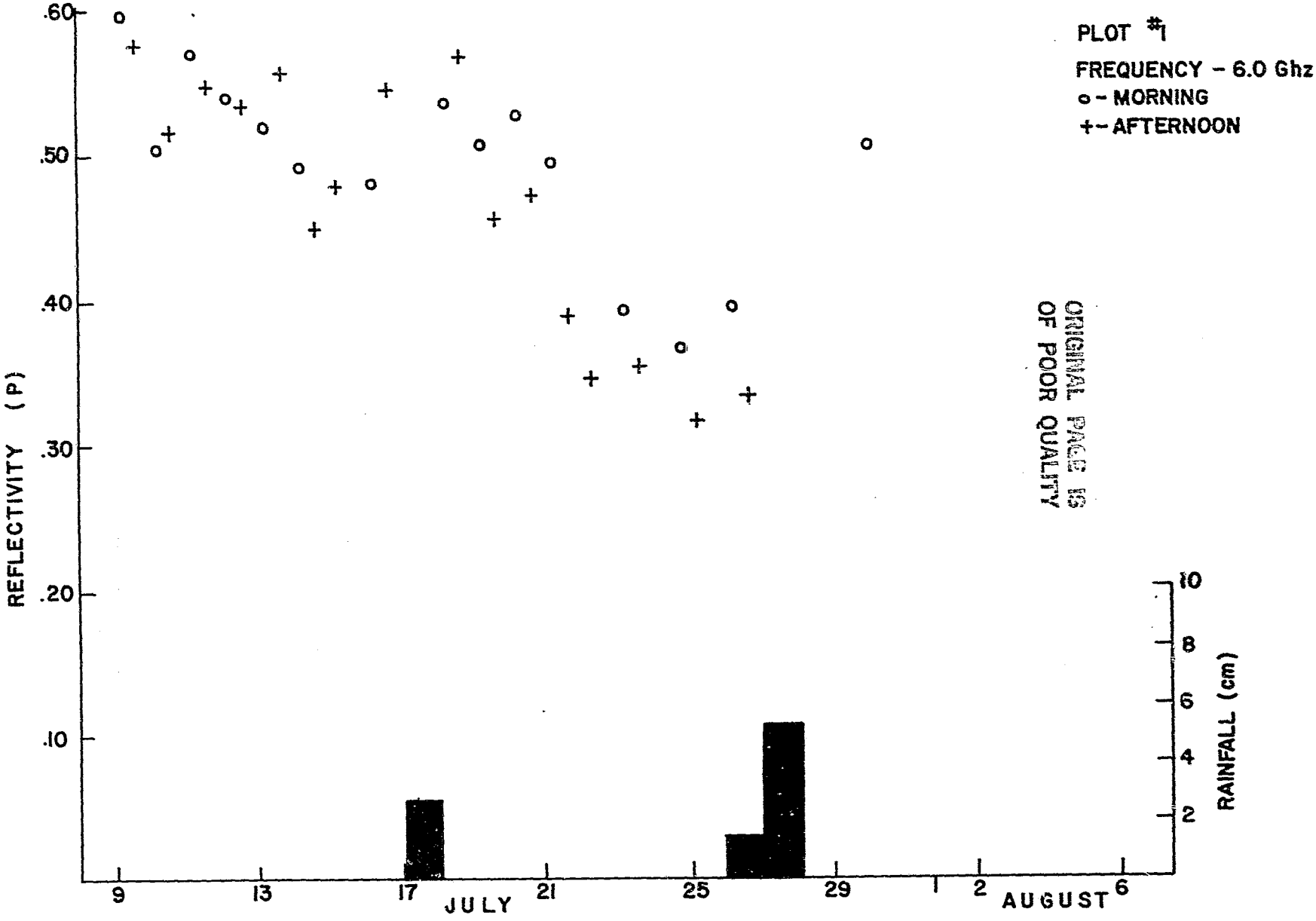

FIGURE 11. 6.0 Ghz REFLECTIVITY vs. TIME FOR PLOT 1

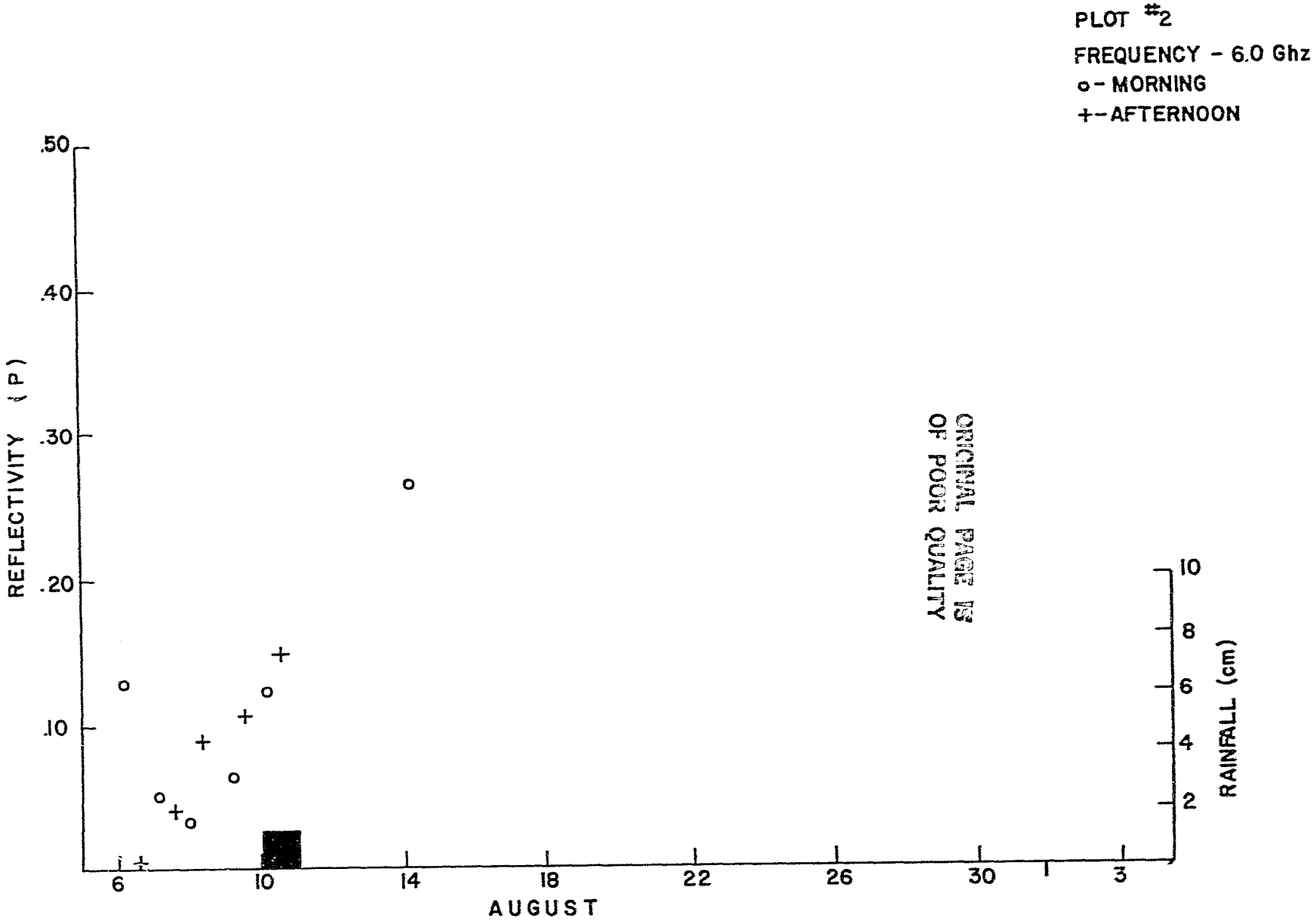

FIGURE 12. 6.0 Ghz REFLECTIVITY vs. TIME FOR PLOT 2

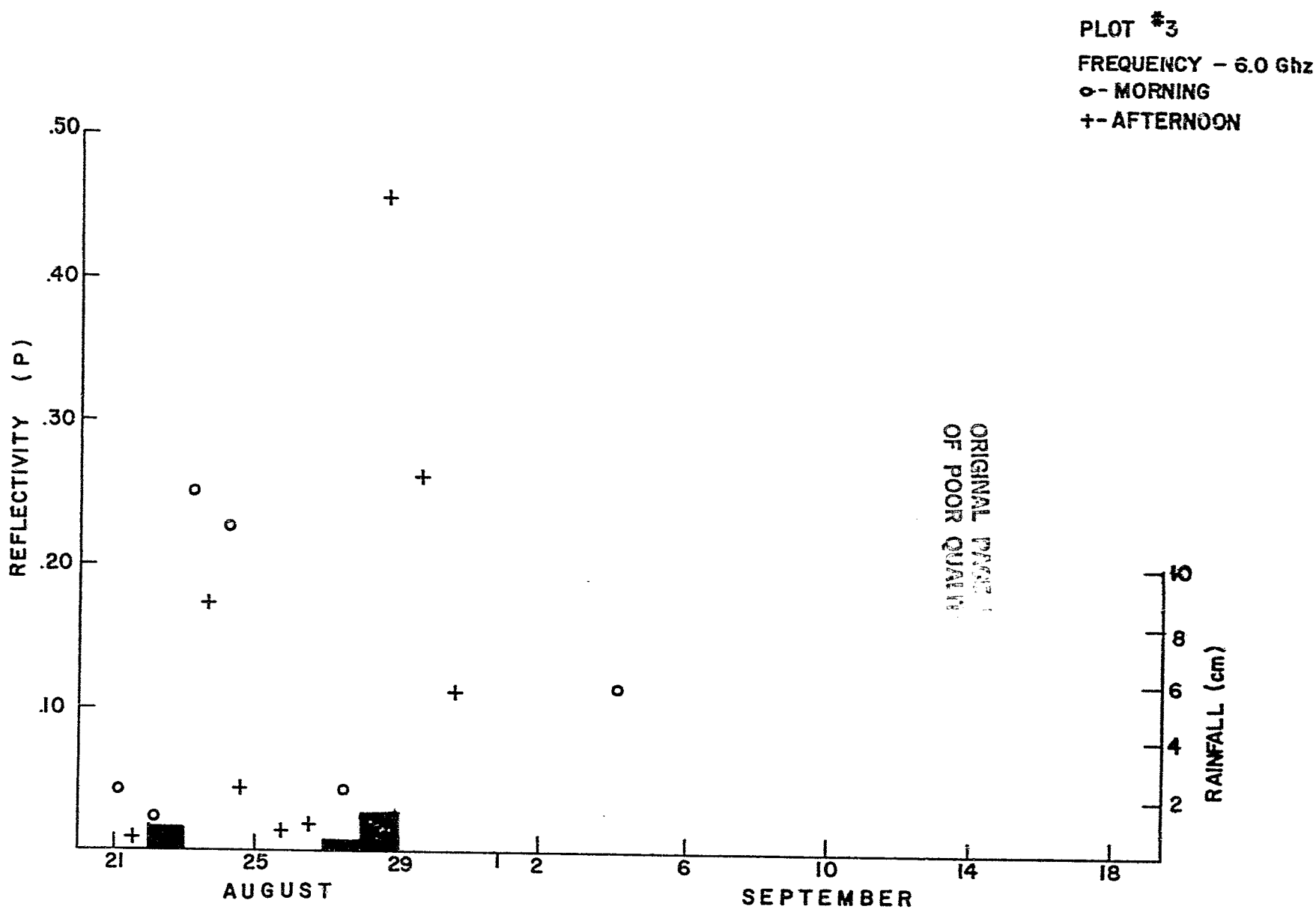

FIGURE 13. 6.0 Ghz REFLECTIVITY vs. TIME FOR PLOT 3

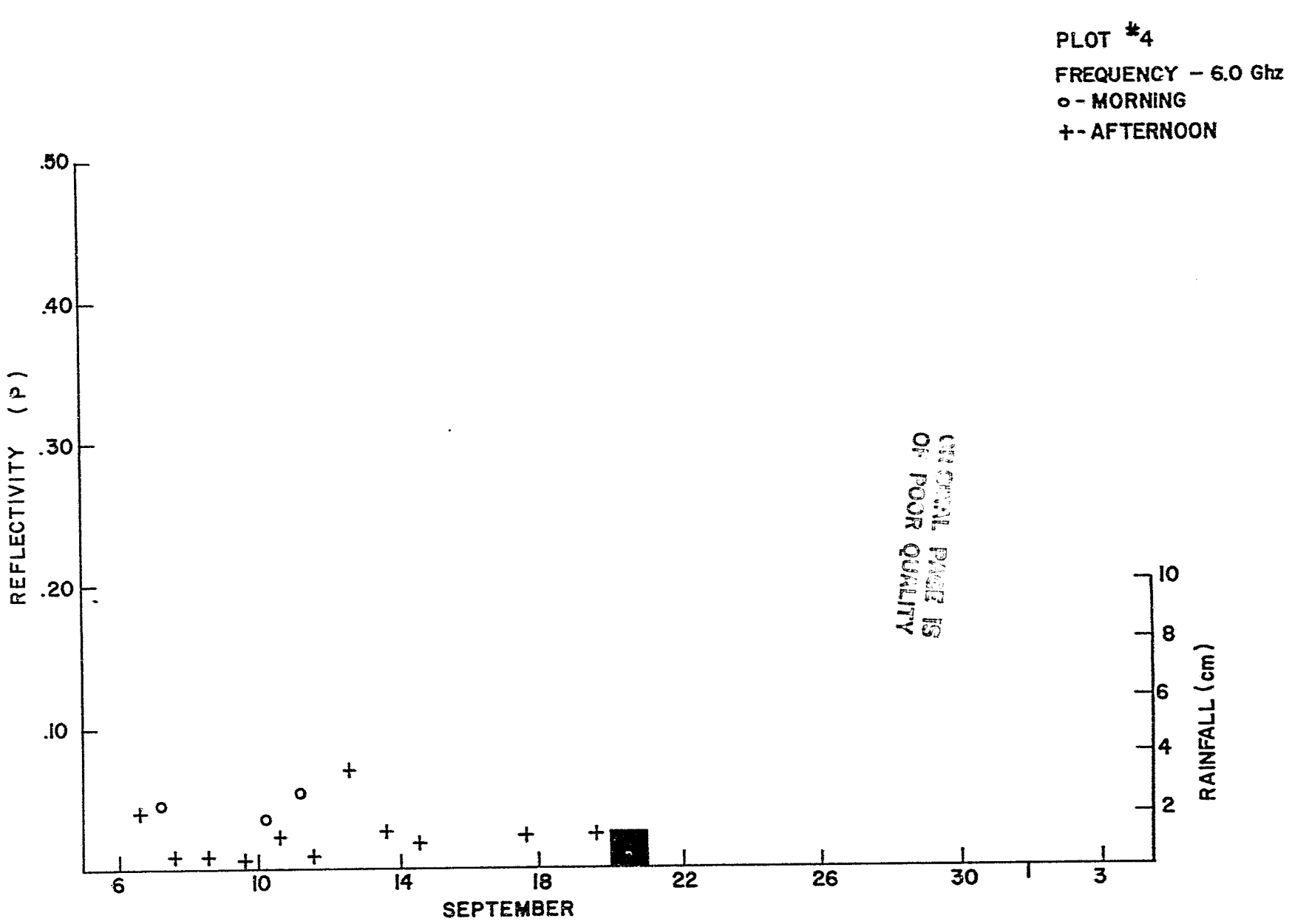

FIGURE 14. 6.0 Ghz REFLECTIVITY vs. TIME FOR PLOT 4

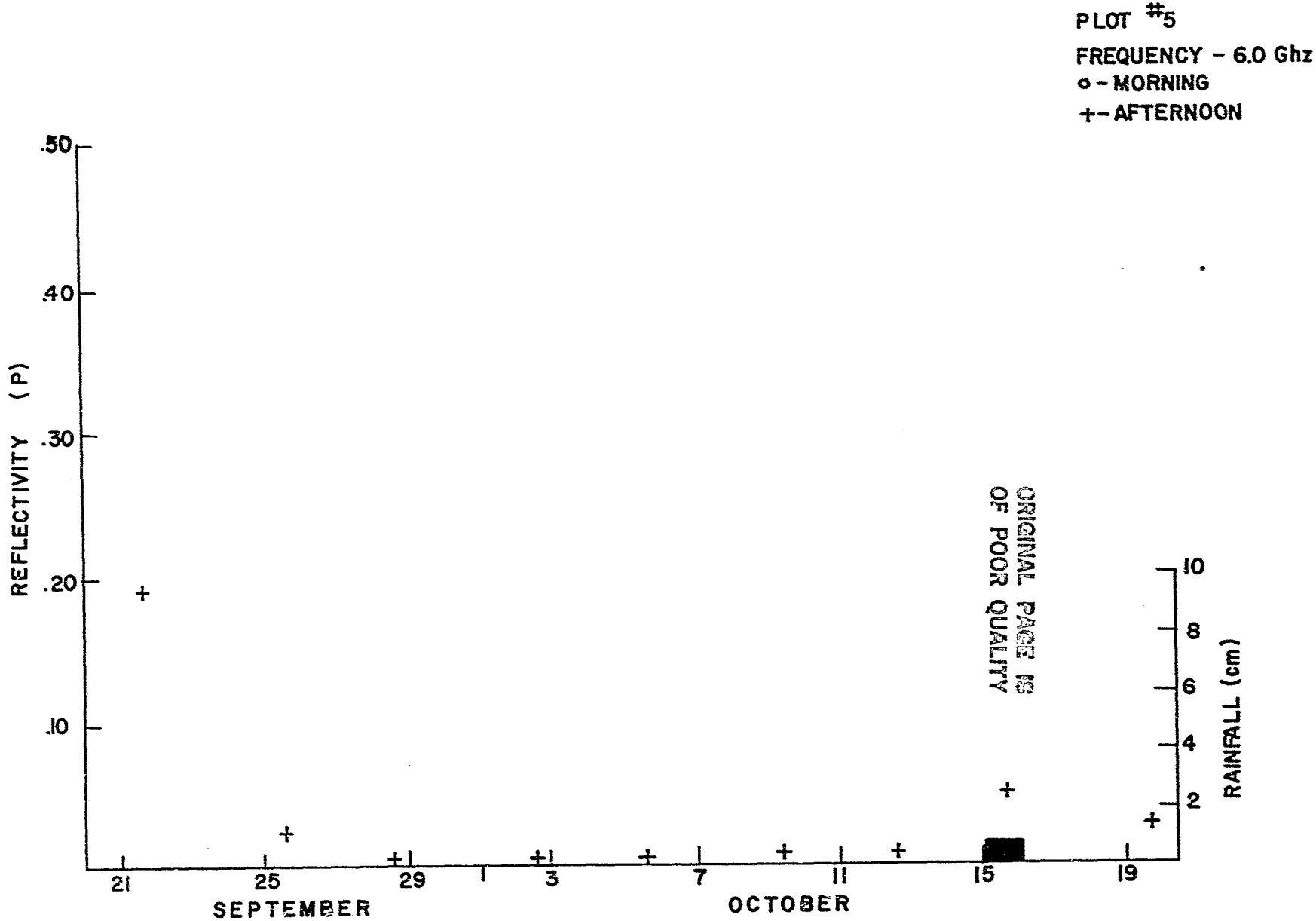

FIGURE 15. 6.0 Ghz REFLECTIVITY vs. TIME FOR PLOT 5

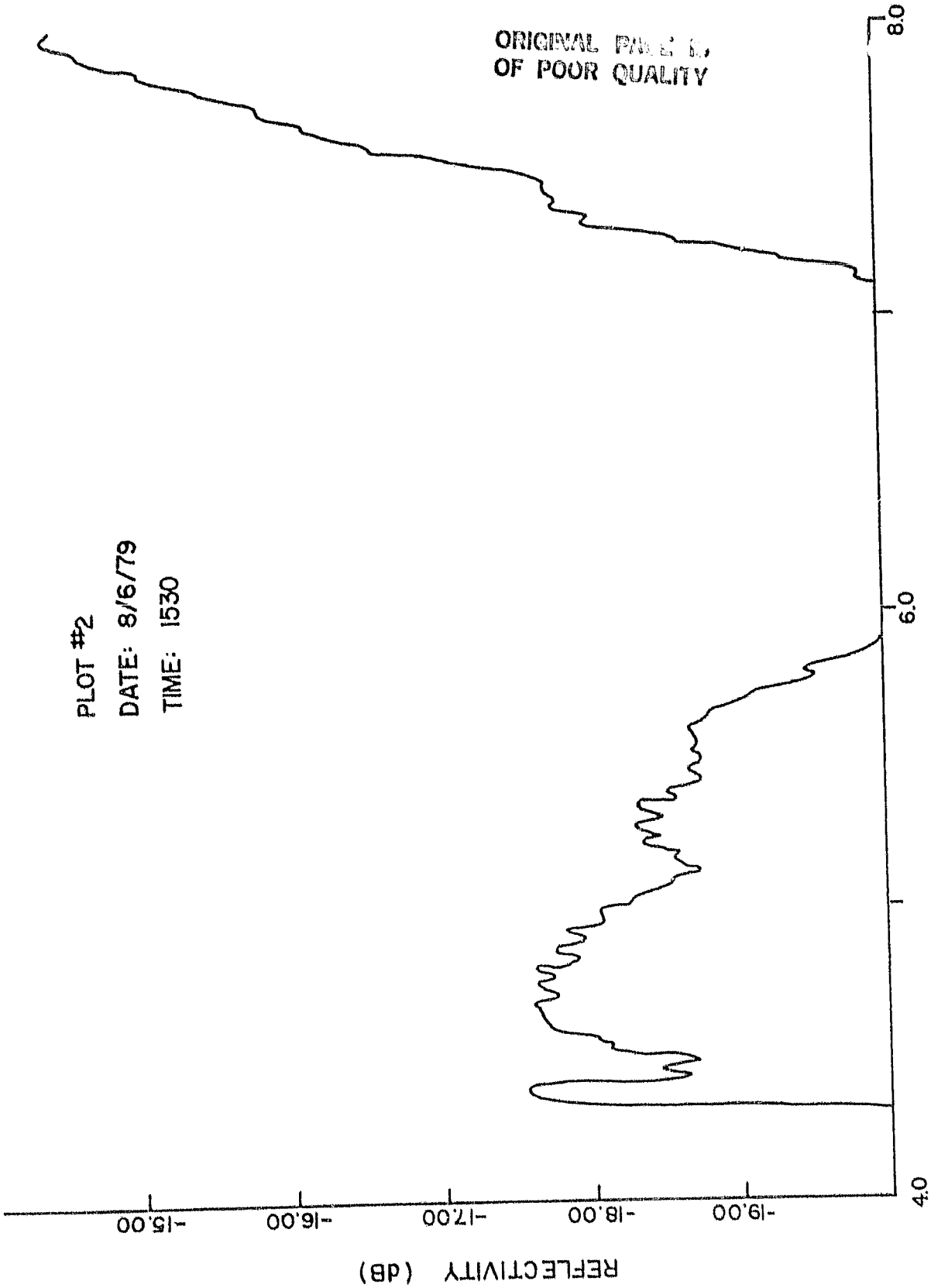

FIGURE 16. EXAMPLE OF MULTI-LAYER EFFECT FOR PLOT 2

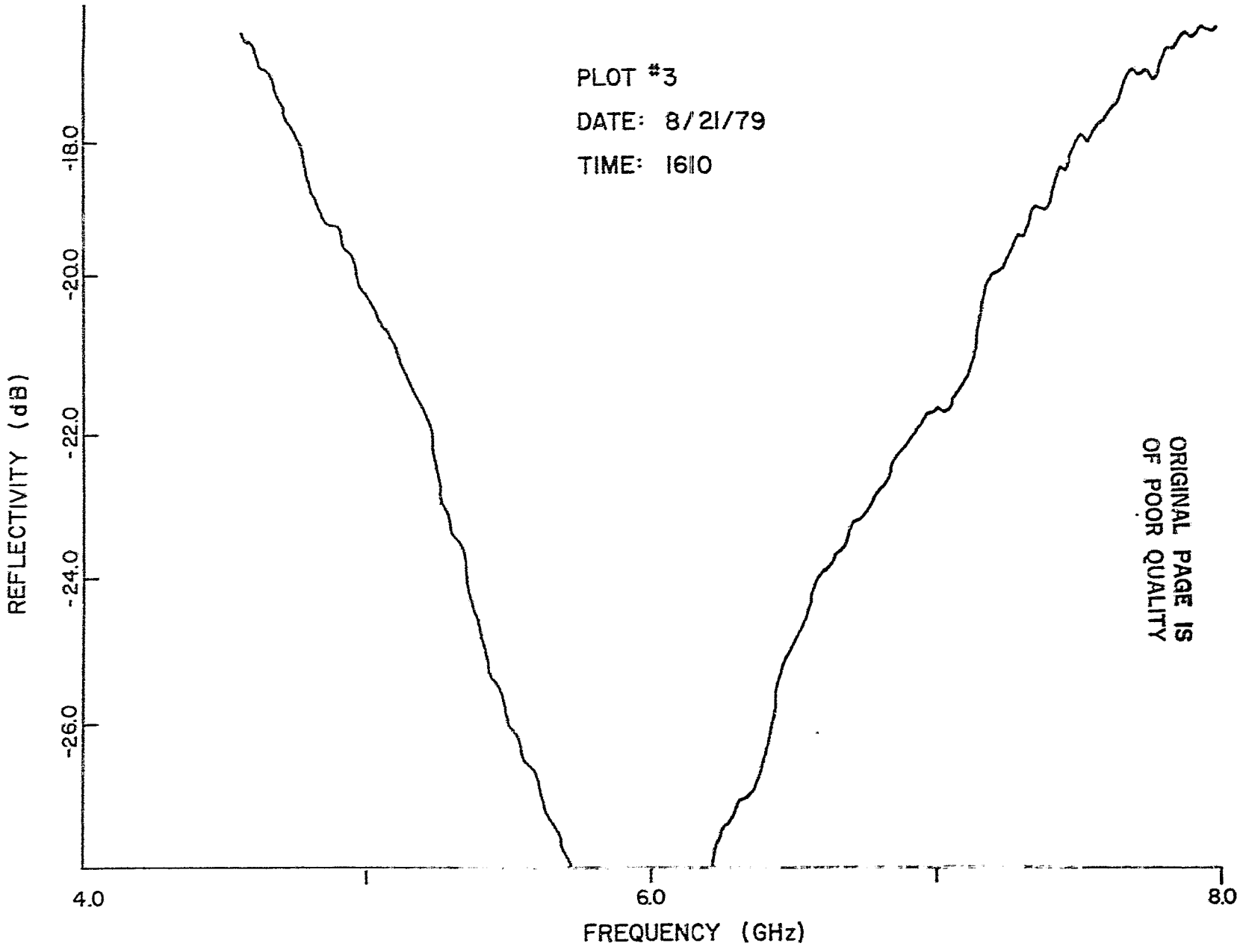

FIGURE 17. EXAMPLE OF MULTI-LAYER EFFECT FOR PLOT 3.

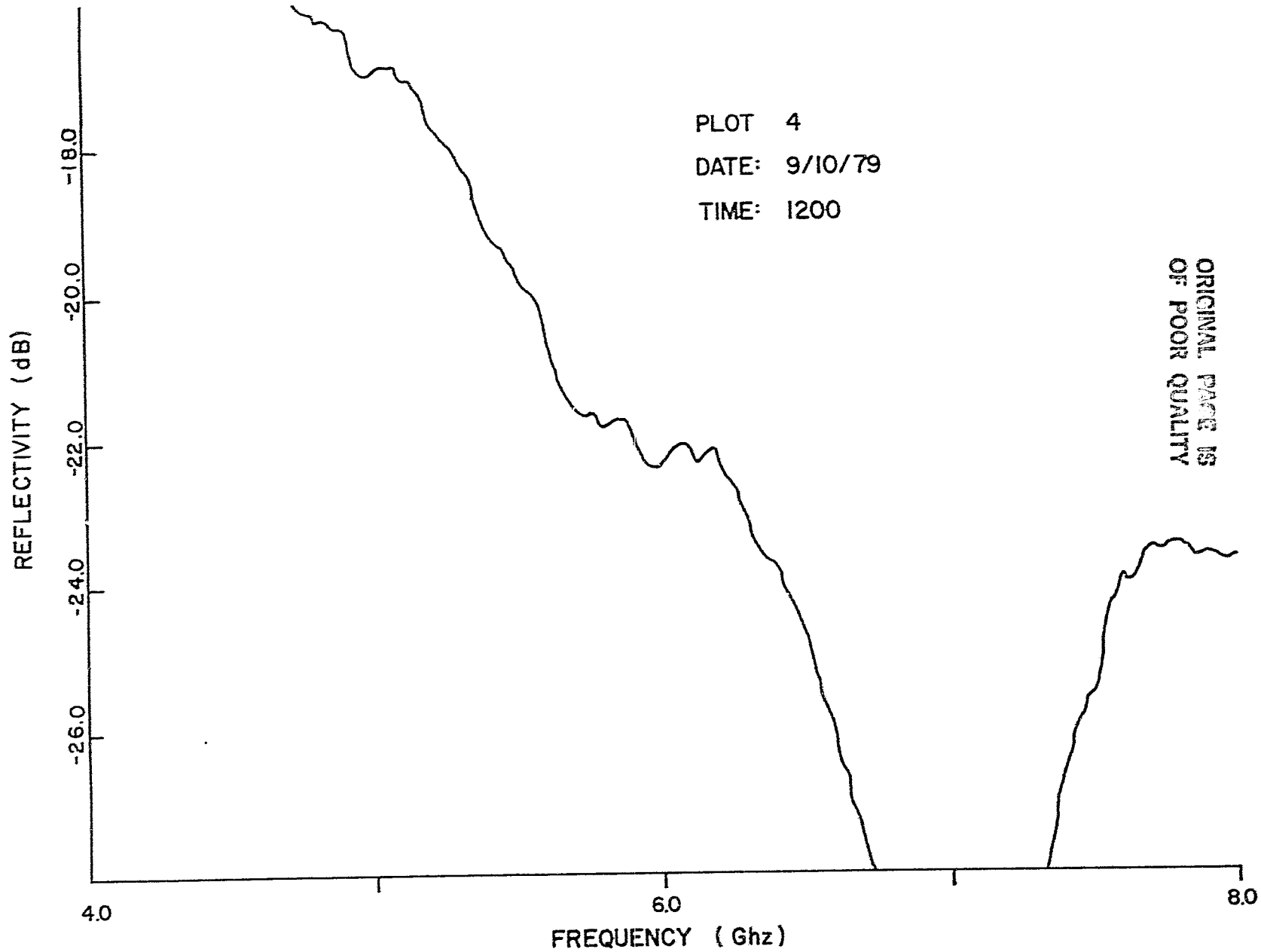

FIGURE 18. EXAMPLE OF MULTI-LAYER EFFECT FOR PLOT 4

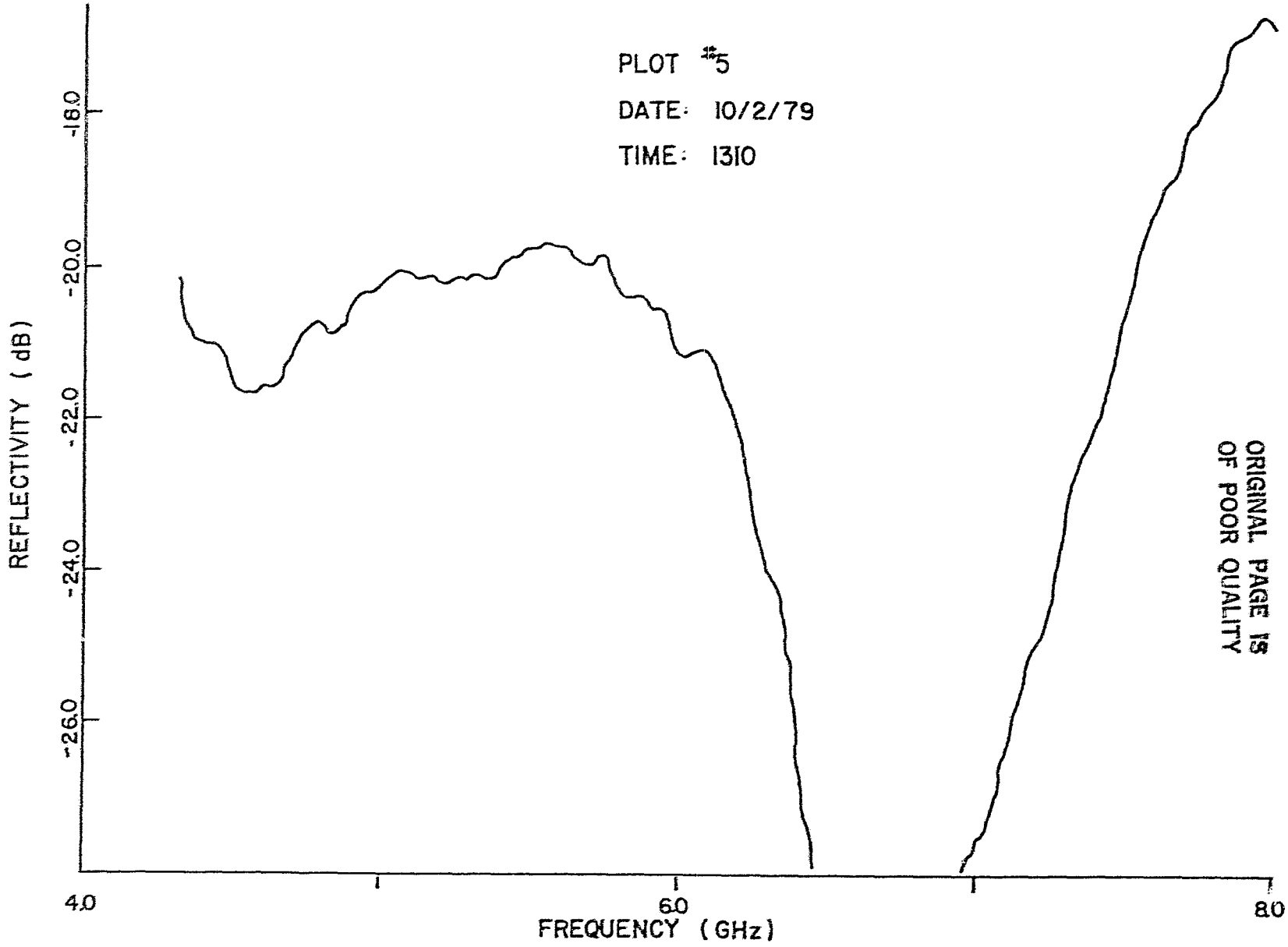

FIGURE 19. EXAMPLE OF MULTI-LAYER EFFECT FOR PLOT 5

effects for each respective plot. The reasons that the multilayer effects did not form for the 1 to 2 Ghz data and the 4 to 8 Ghz data of plot 1 are attributed to several factors that hindered the redistribution of the soil moisture from the soil surface. These factors were the compaction of the soil of plot 1, the significant amounts of rainfall on plots 1, 2 and 3; and the mild weather during plots 4 and 5 typically consisting of warm days and cold nights with large morning dew accumulations.

4.3 SOIL MOISTURE AND BULK DENSITY DATA

Soil moisture sampling was conducted immediately after each reflectivity measurement. The soil sampling techniques used were refined and changed as the experiment progressed in order to meet the requirements and objectives of the experiment.

As previously stated an objective of the reflectivity measurement was to observe coherent multilayer effects caused by the soil. This objective made it desirable to know the moisture gradient in the upper centimeter of the soil surface. It was with this desire in mind that the first centimeter of soil surface was sampled at quarter centimeter increments for plot 1 and 2. A specially designed trowel was to have been used for this sampling for both plots but a core tool had to be substituted for plot 1 because of its compacted soil surface. Soil samples were taken from four different locations for each measurement. The locations in these two test plots are given by the quadrants shown in Figure 20. Because soil moisture is a destructive test and the test plots had a finite area, it was necessary to reduce the number of soil sampling locations to two for plots 3, 4, and 5. The areas for the soil sampling locations were on the east and west sides of the test plots and were dubbed E and W, respectively. These soil sampling locations are depicted in Figure 21.

Rainfall weathers the soil surface, and as a consequence, the bulk density of soil may be changed by rainfall. Because of the frequent rainfall during the summer and its resultant effects, bulk density measurement of plot 1 was hindered and the bulk density testing of plot 2 eliminated. An obvious solution to this problem would have been to sample more frequently for bulk density. But bulk density sampling is, like soil moisture sampling if not more so, a

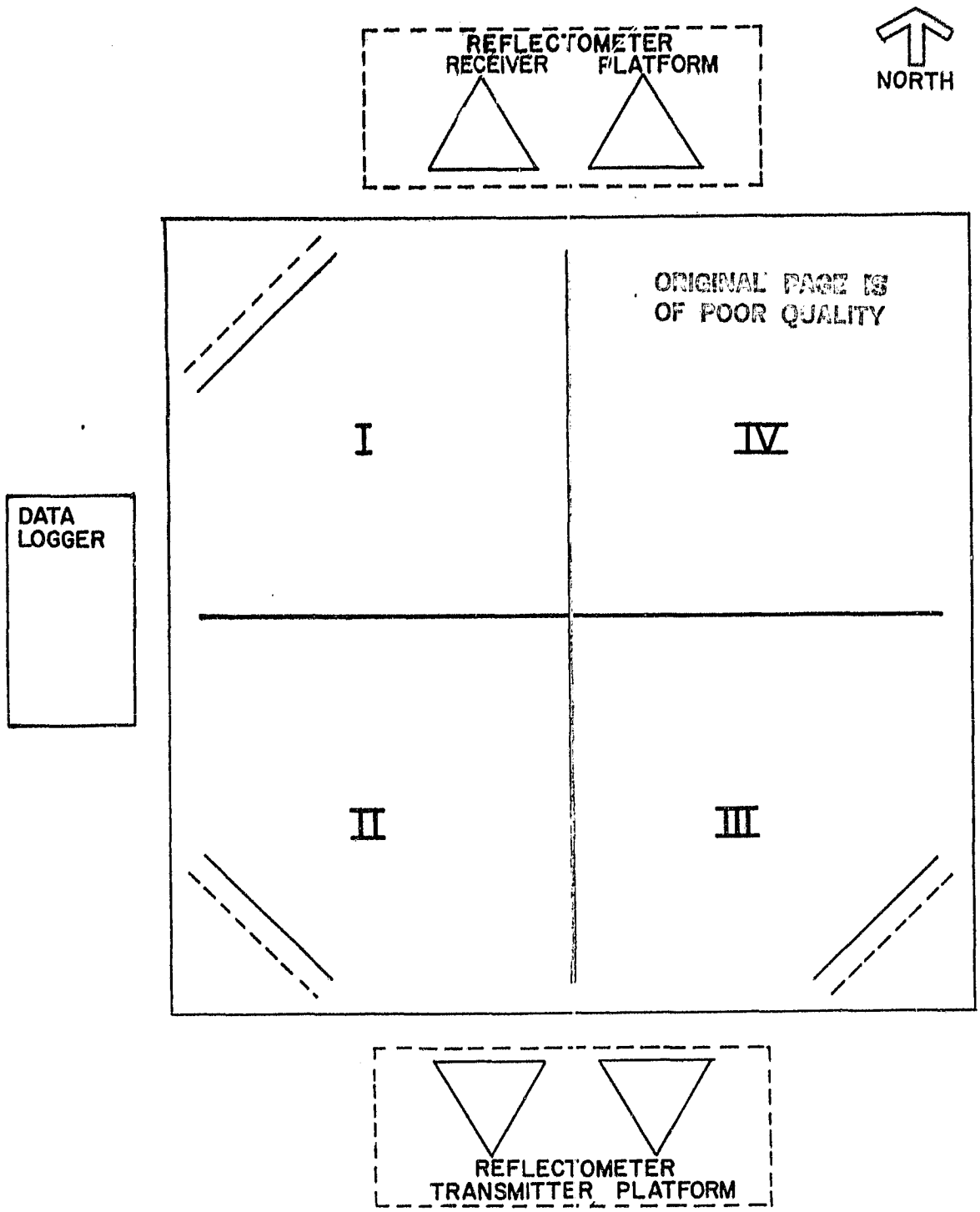

FIGURE 20. PLOT QUADRANT DESIGNATION

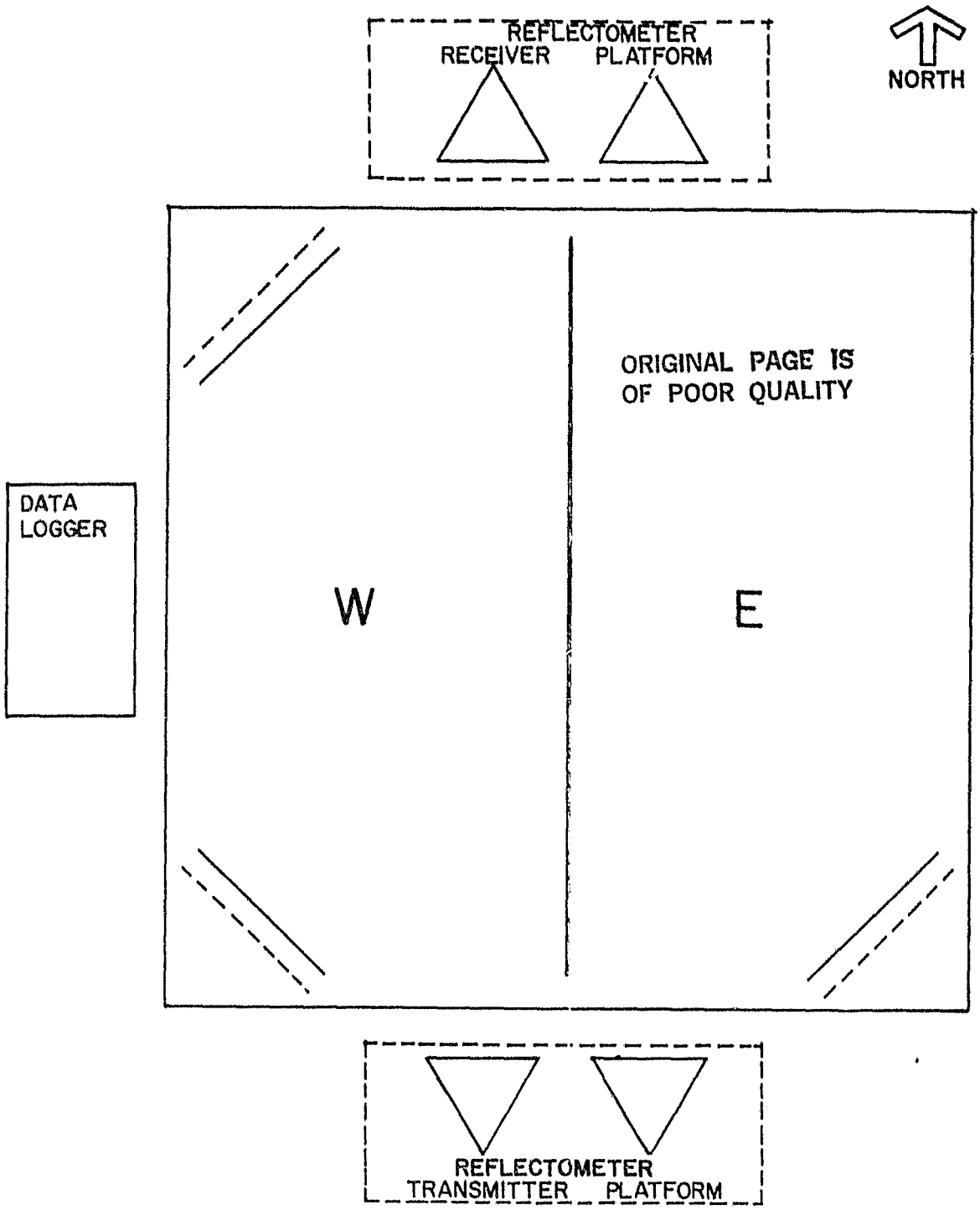

FIGURE 21. E AND W DESIGNATION USED IN THE SOIL SAMPLING FOR PLOTS 3, 4, AND 5

destructive test. Due to the finite area of the test plot, it was impractical to separately conduct frequent soil moisture and bulk density sampling. This problem was overcome for the soil measurements of test plots 3, 4, and 5 by using a simple plastic cylinder to take soil samples of known volume at the various soil depth intervals. This method allowed the soil sample to serve for both the soil moisture and bulk density measurement.

The soil sampling intervals of the different test plots are given in Table 4. Note that the first centimeter of soil for test plots 3, 4, and 5 was sampled in half-centimeter intervals. All soil samples were immediately weighed after sampling and oven dried at 105°C for a period of twenty-four hours.

The gravimetric, average bulk density, and volumetric moisture content data are given in Appendices C, D, and E, respectively. It should be noted that the initial bulk densities of plot 3 are substituted for those of plot 2. This was necessary because rain eliminated the bulk density testing of plot 2. In order to acquire similar bulk densities and provide a basis for the substitution, a particular objective of plot 3 was to prepare the plot in as similar a manner as possible to that of plot 2. Figures 22 through 26 depict the 0-1 centimeter volumetric moisture content variation for the five different plot cycles.

TABLE 4. SOIL SAMPLING INTERVALS

Plot Number	Depth Interval (cm)
1	0-.25, .25-.50, .50-.75, .75-1.0, 1-2, 2-4
2	0-.25, .25-.50, .50-.75, .75-1.0, 1-2, 2-5, 5-9, 9-15
3, 4, and 5	0-.5, .5-1.0, 1-2, 2-5, 5-9, 9-15

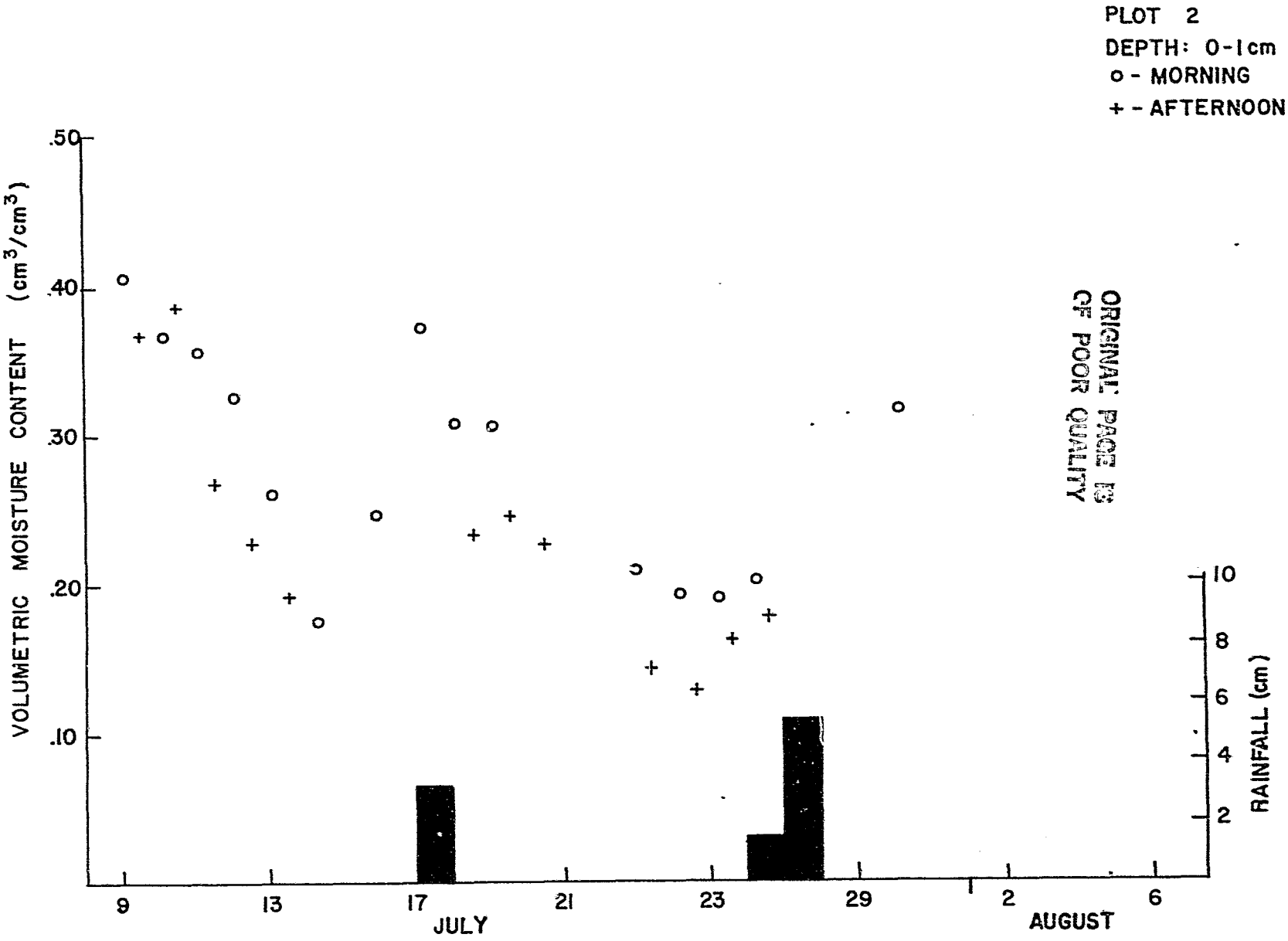

FIGURE 22. THE 0-1 CM DEPTH INTERVAL VOLUMETRIC MOISTURE vs. TIME FOR PLOT 1

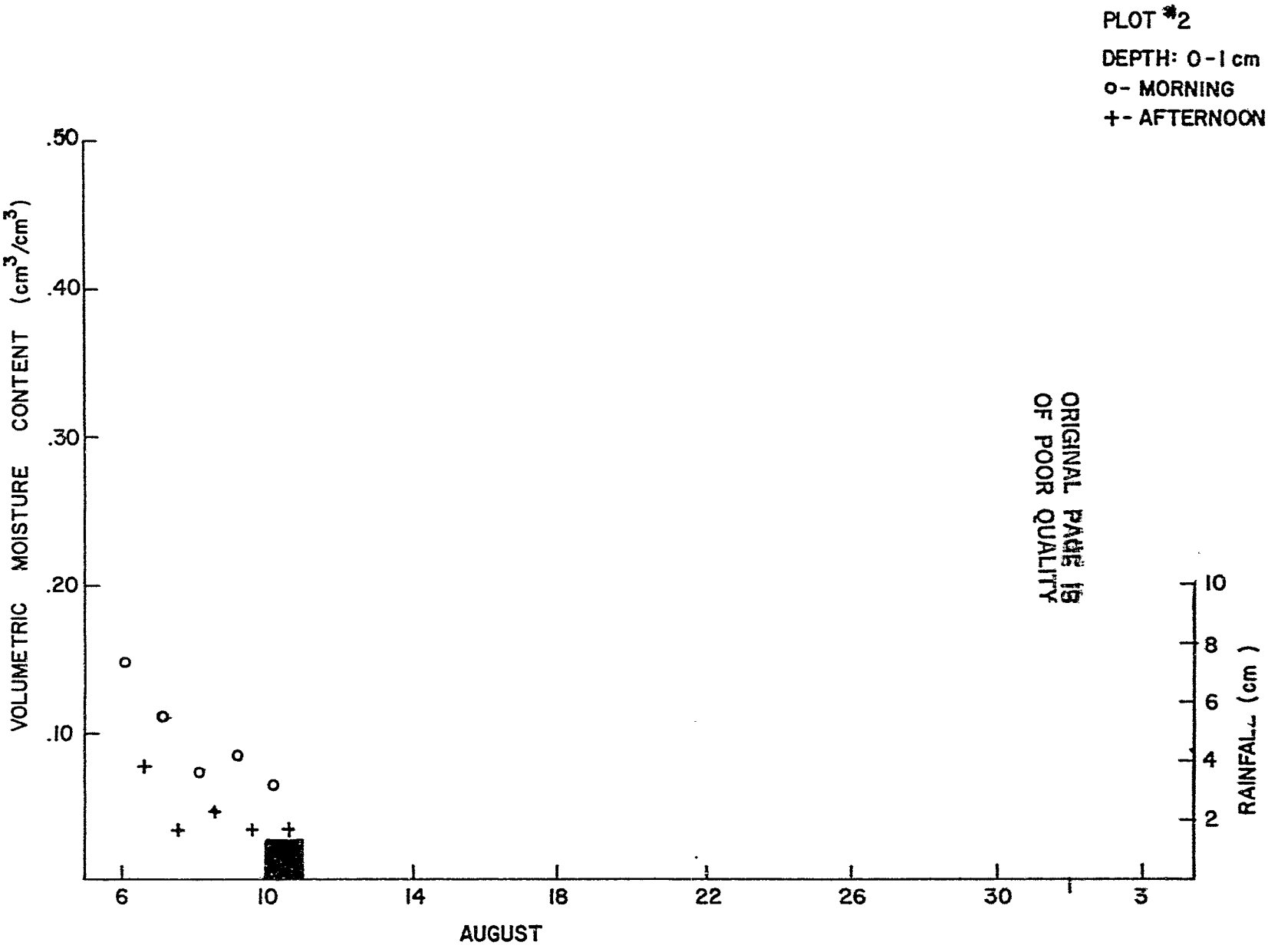

FIGURE 23. THE 0-1 CM DEPTH INTERVAL VOLUMETRIC MOISTURE vs. TIME FOR PLOT 2

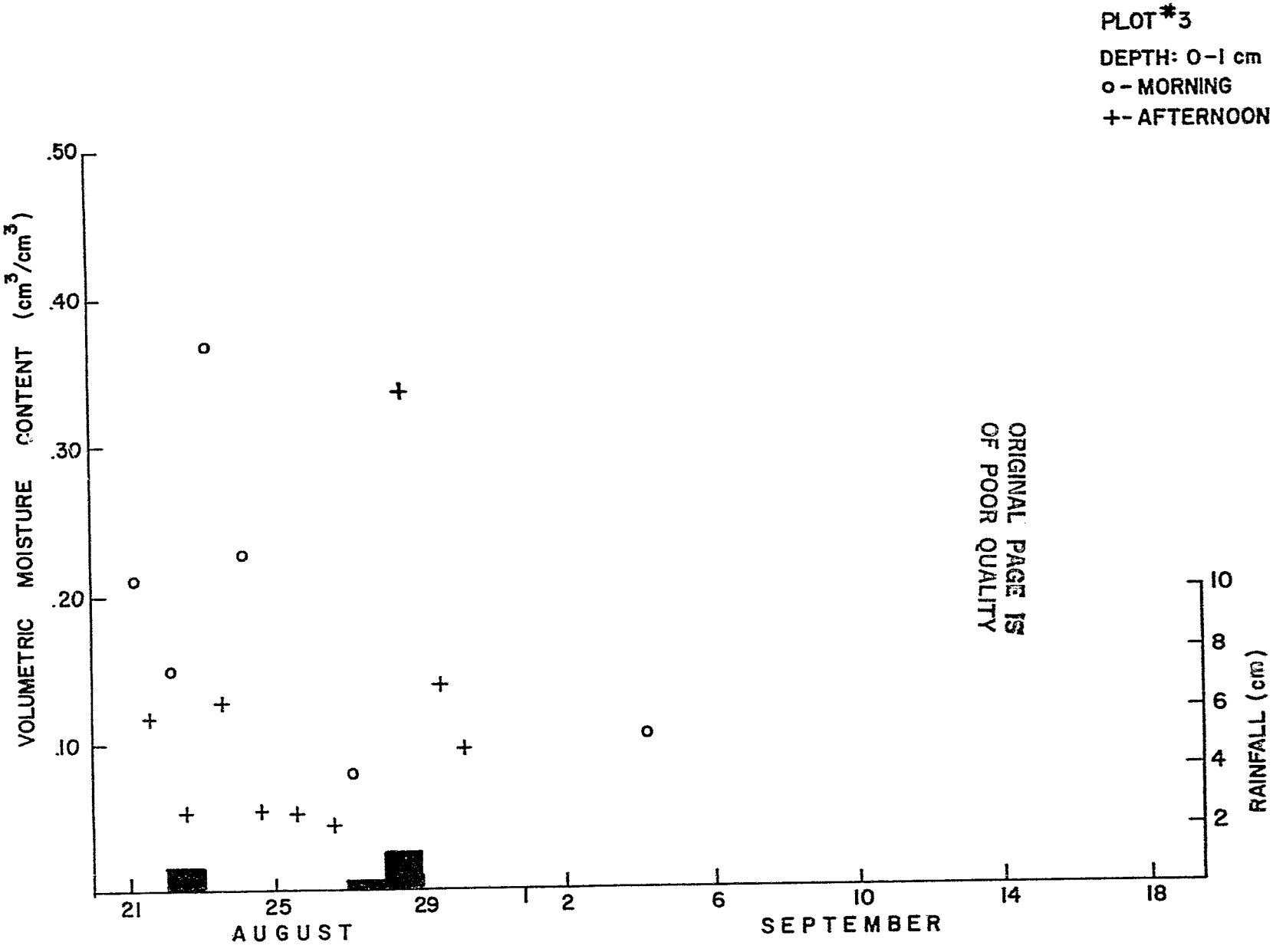

FIGURE 24. THE 0-1 CM DEPTH INTERVAL VOLUMETRIC MOISTURE vs. TIME FOR PLOT 3

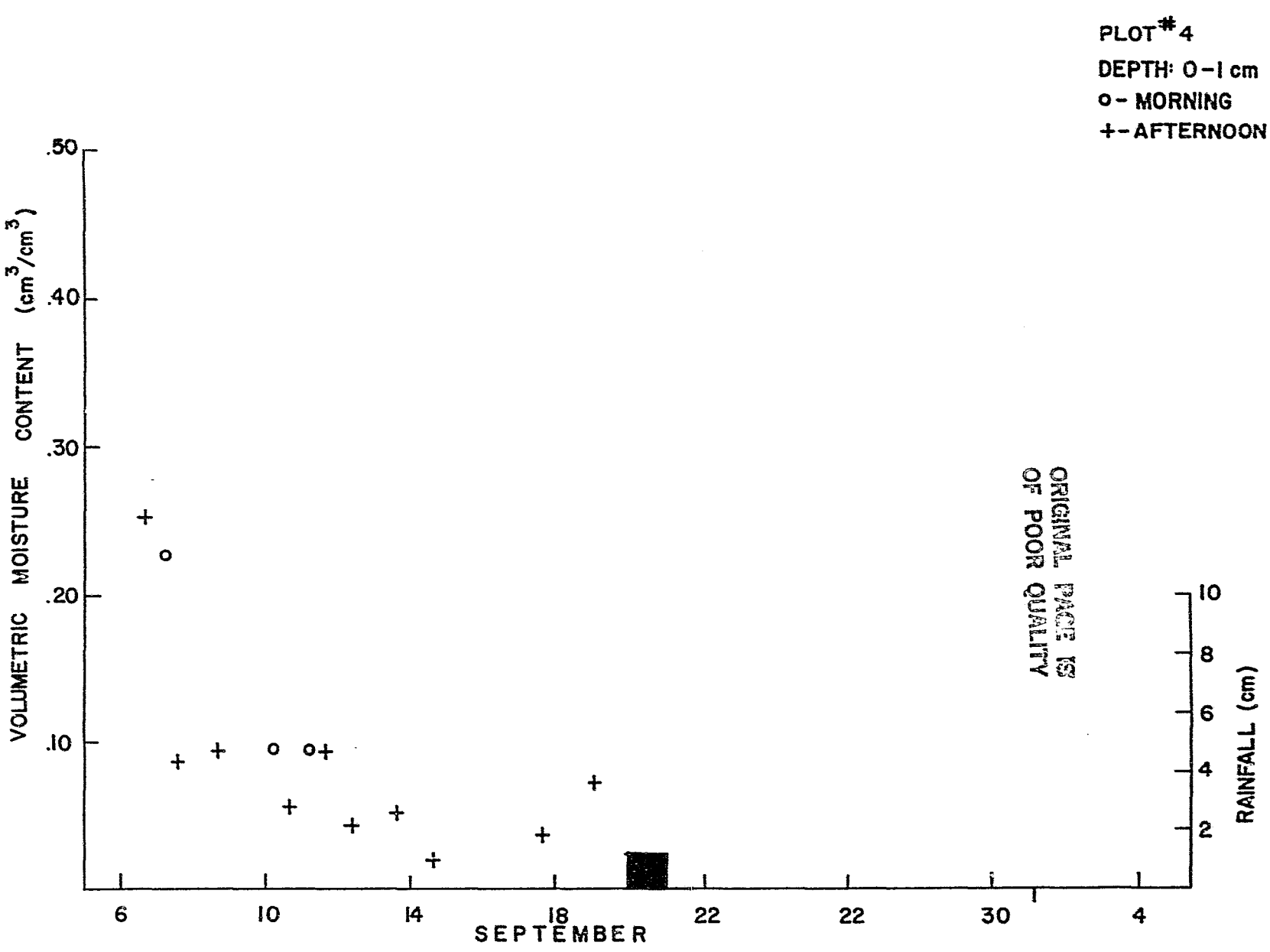

FIGURE 25. THE 0-1 CM DEPTH INTERVAL VOLUMETRIC MOISTURE vs. TIME FOR PLOT 4

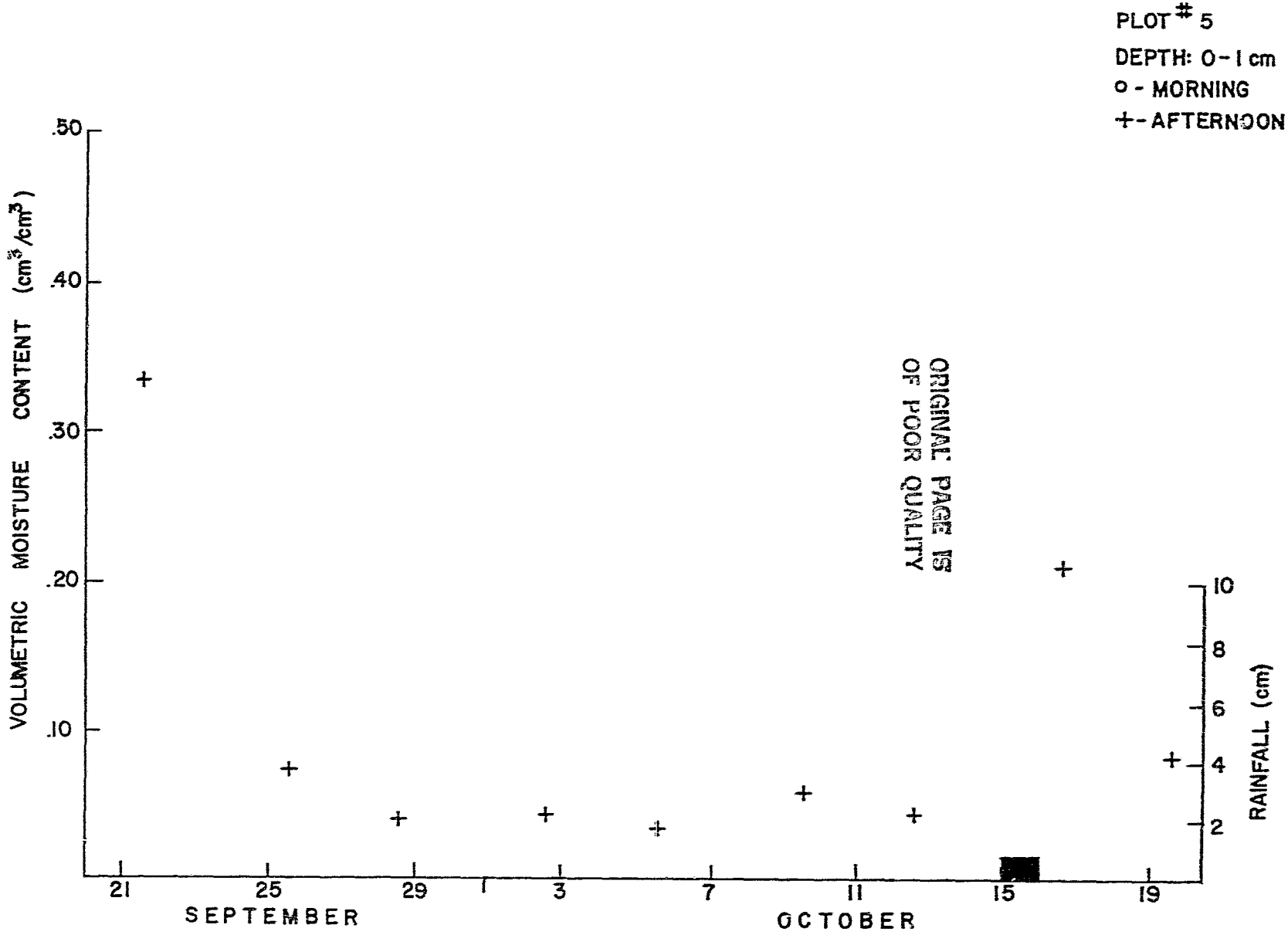

FIGURE 26. THE 0-1 CM DEPTH INTERVAL VOLUMETRIC MOISTURE vs. TIME FOR PLOT 5

4.4 AIR AND SOIL TEMPERATURE DATA

The goal of the thermal portion of the experiment was to monitor the air and soil temperature on a diurnal basis. Implementation of this objective led to the collection of a large volume of data obtained under various soil meteorlogical conditions. As a consequence of this, the thermal data base was considered to be sufficient at the end of plot 4 to model the experiment; as a result this portion of the experiment was terminated on September 12, 1979. A record of the temperature measurements is given in Appendix F. Extracts of the temperature data are given in Appendix G. Because of the large number of temperature data, only those measurements that coincide with the reflectivity measurements are present.

A quadrant number designation gives the bank location in the test plot of the thermocouple used to measure an individual thermal datum This quadrant designation was adhered to for all of the test plots and it is the same as that for the soil moisture sampling for test plots 1 and 2 given in Figure 19. The long term variation of the average 0-1 centimeter soil temperature is depicted in Figures 27 through 30 for the four plots of the thermal measurement.

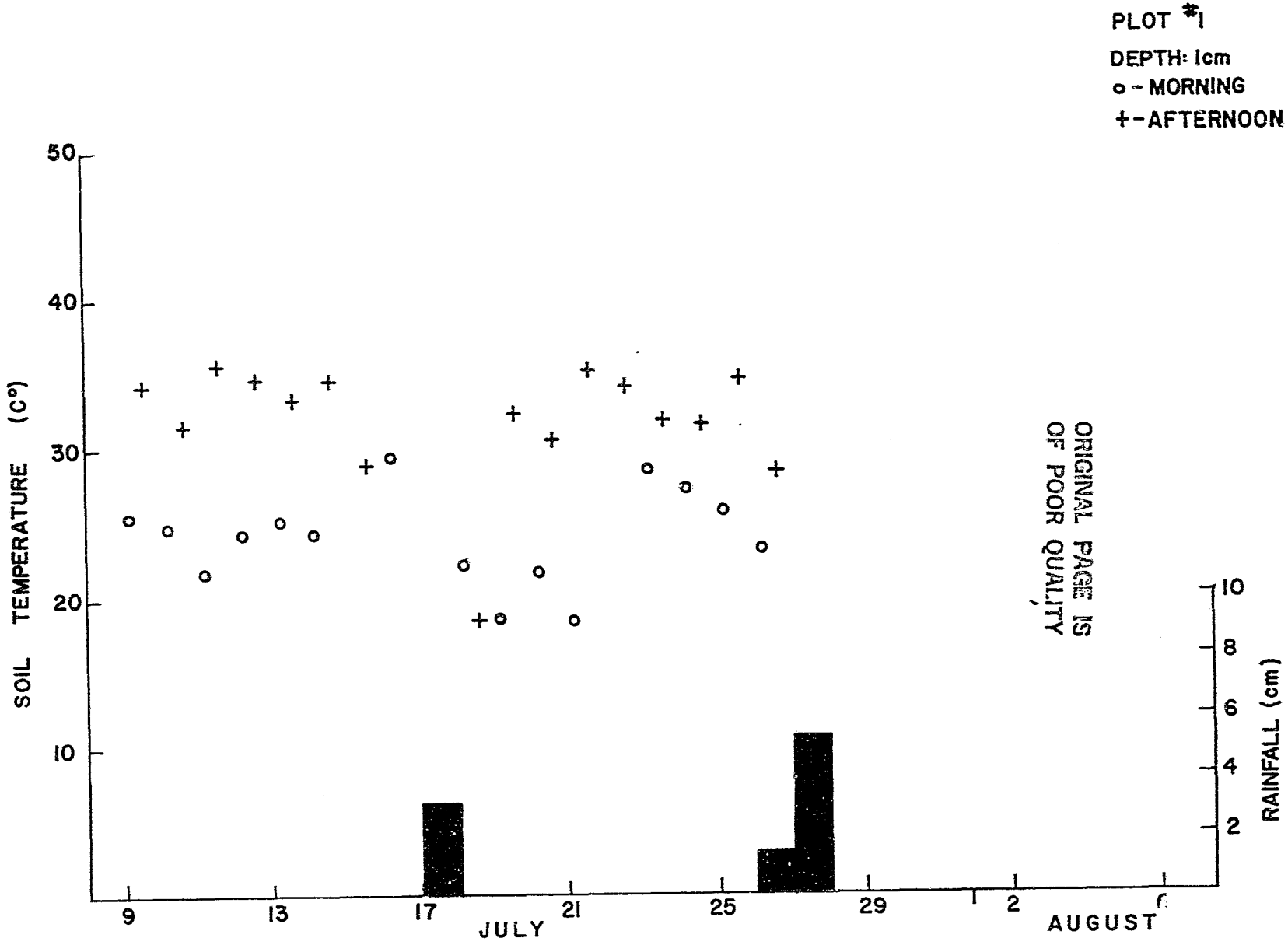

FIGURE 27. THE 1 CM DEPTH SOIL TEMPERATURE vs. TIME FOR PLOT 1

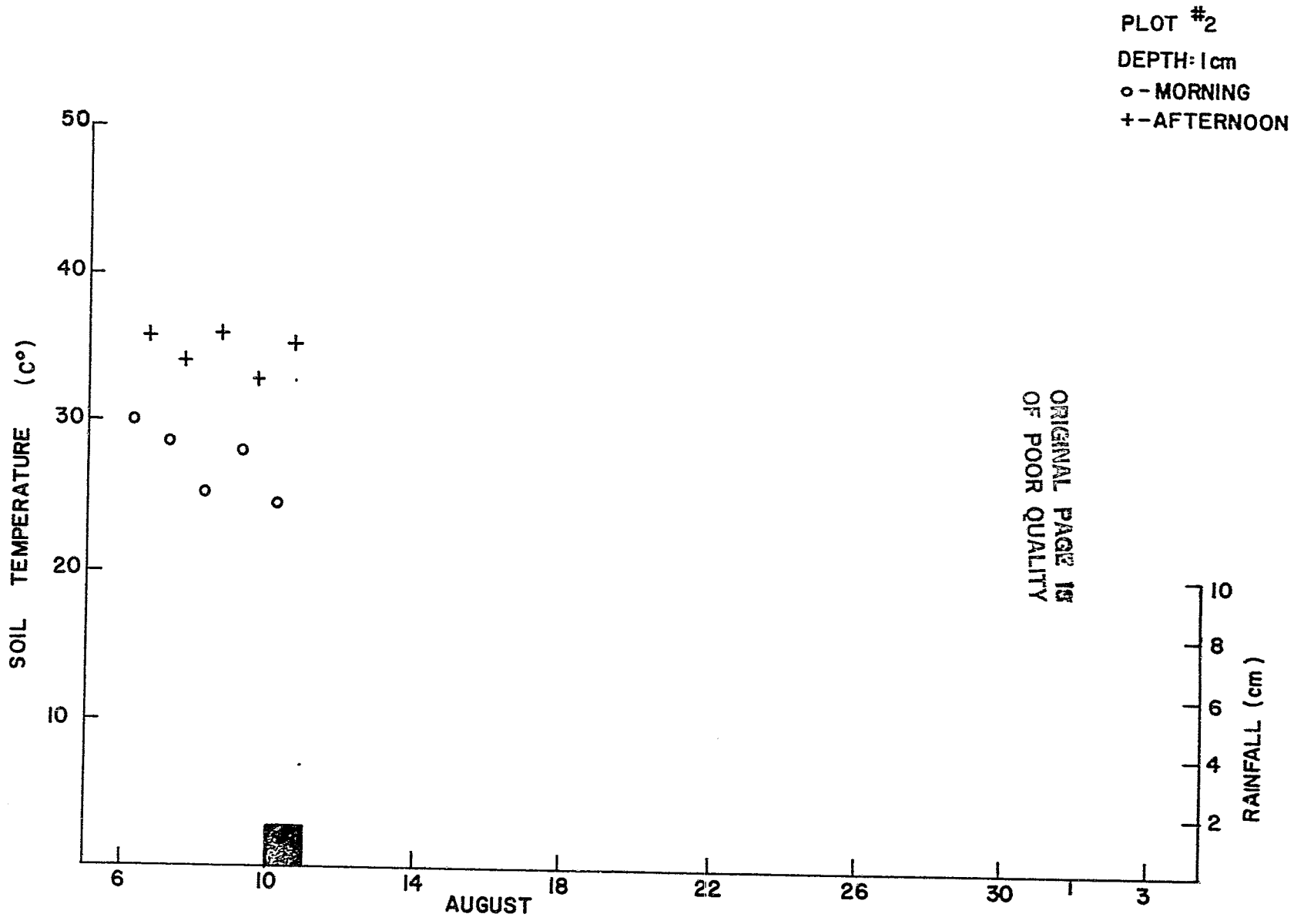

FIGURE 28. THE 1 CM DEPTH SOIL TEMPERATURE vs. TIME FOR PLOT 2

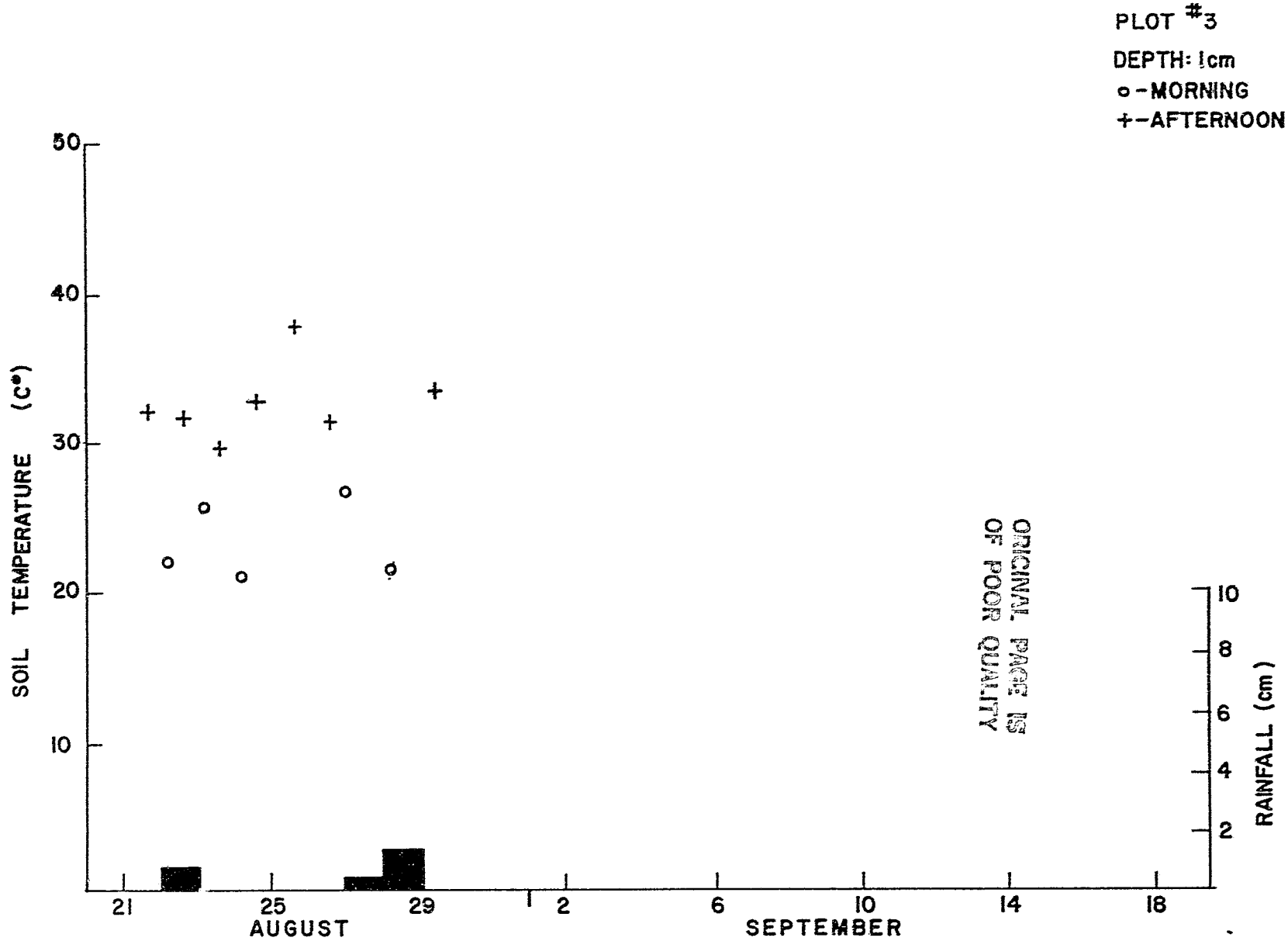

FIGURE 29. THE 1 CM DEPTH SOIL TEMPERATURE vs. TIME FOR PLOT 3

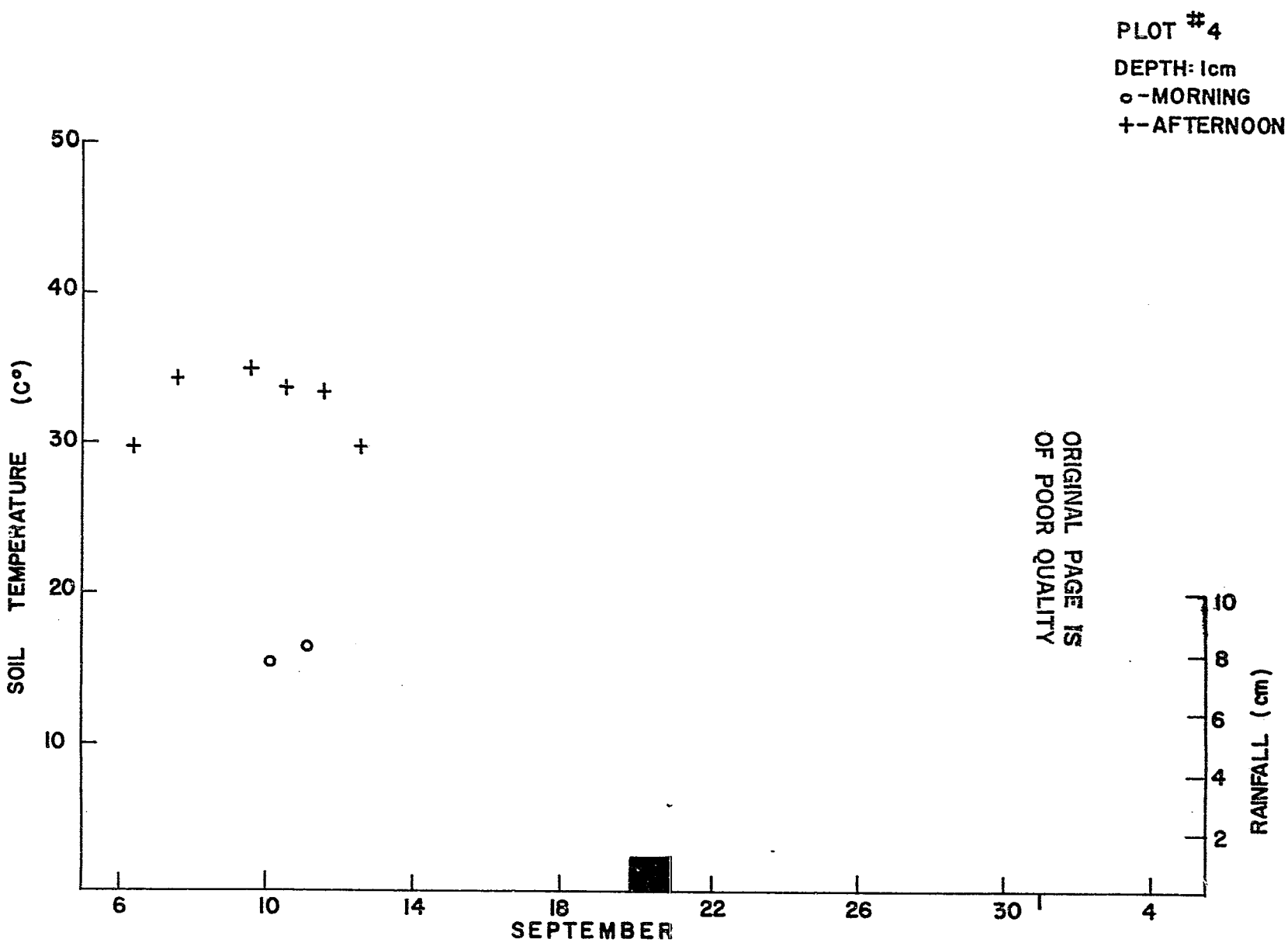

FIGURE 30. THE 1 CM DEPTH SOIL TEMPERATURE vs. TIME FOR PLOT 4

4.5 DIURNAL DATA

Diurnal measurements were conducted during the measurement intervals of Plot 1 and Plot 4. The measurement techniques employed for the diurnals were consistent with those of the particular plot intervals.

The diurnal cycle of Plot 1 began July 26 at 0615. Measurements were conducted through the day at two hour intervals until 2010 when this cycle had to be terminated because of rain. The reflectivity, gravimetric and volumetric moisture, and the air and soil temperature data of this diurnal are presented in Appendix I. Figures 31 through 34 graphically depict the hourly variation of the 1.25 Ghz reflectivity, 6.0 Ghz reflectivity, 0-1 cm volumetric moisture content, and the 1 cm soil temperature, respectively.

The data for the diurnal cycle of Plot 4 are summarized in Appendix J in a similar manner as the diurnal data of Plot 1. The diurnal cycle of Plot 4 began August 10 at 0635 with measurements continuing to 2230 at two hour intervals. A measurement was made at 0700 of the next day to complete the cycle. The hourly variations of the 1.25 Ghz reflectivity, the 6.0 Ghz reflectivity, the 0-1 cm volumetric moisture, and the 1 cm soil temperature of this diurnal cycle are shown in Figures 35 through 38, respectively.

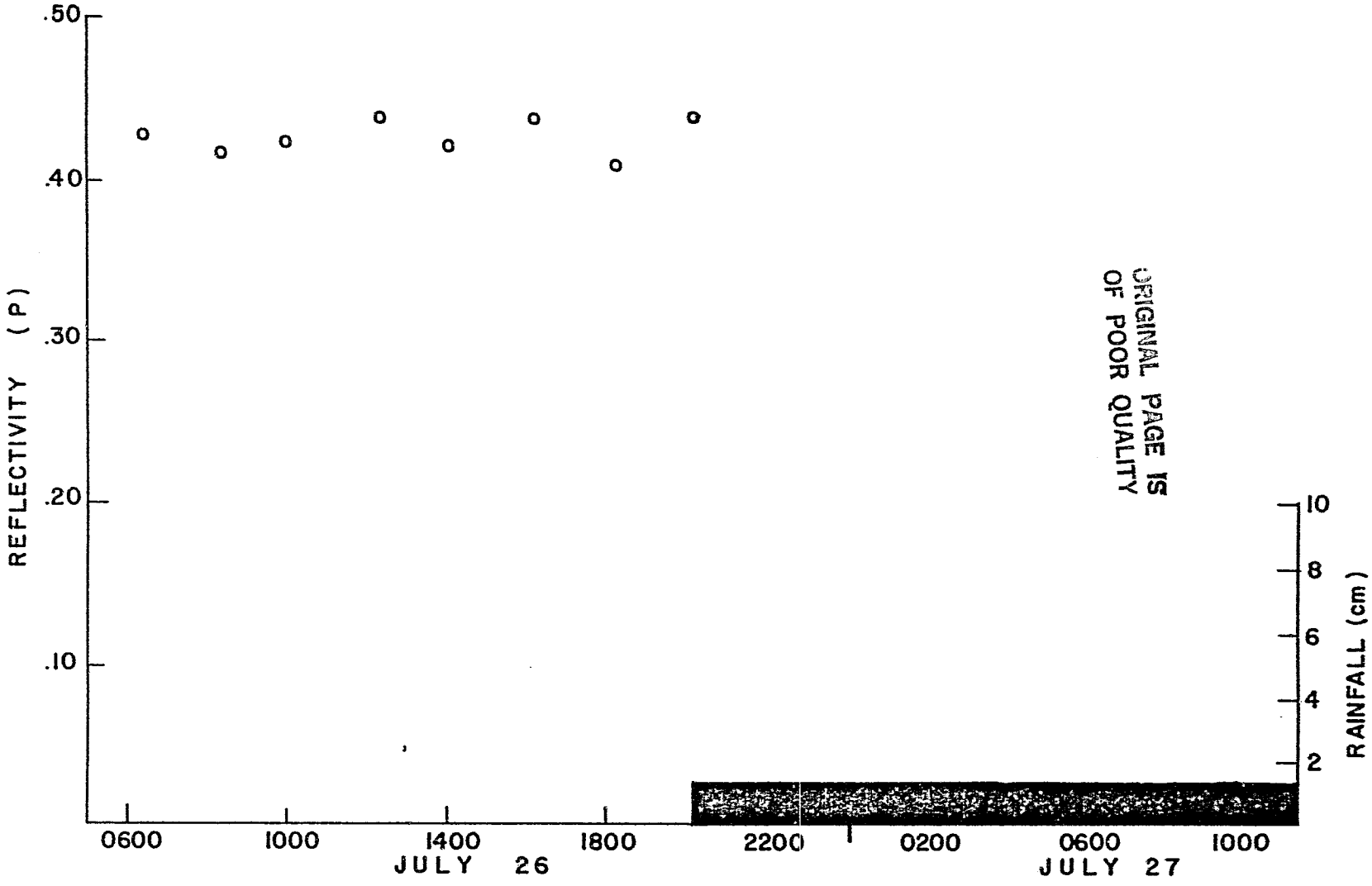

FIGURE 31. THE 1.25 Ghz REFLECTIVITY vs. TIME FOR THE DIURNAL CYCLE OF PLOT 1

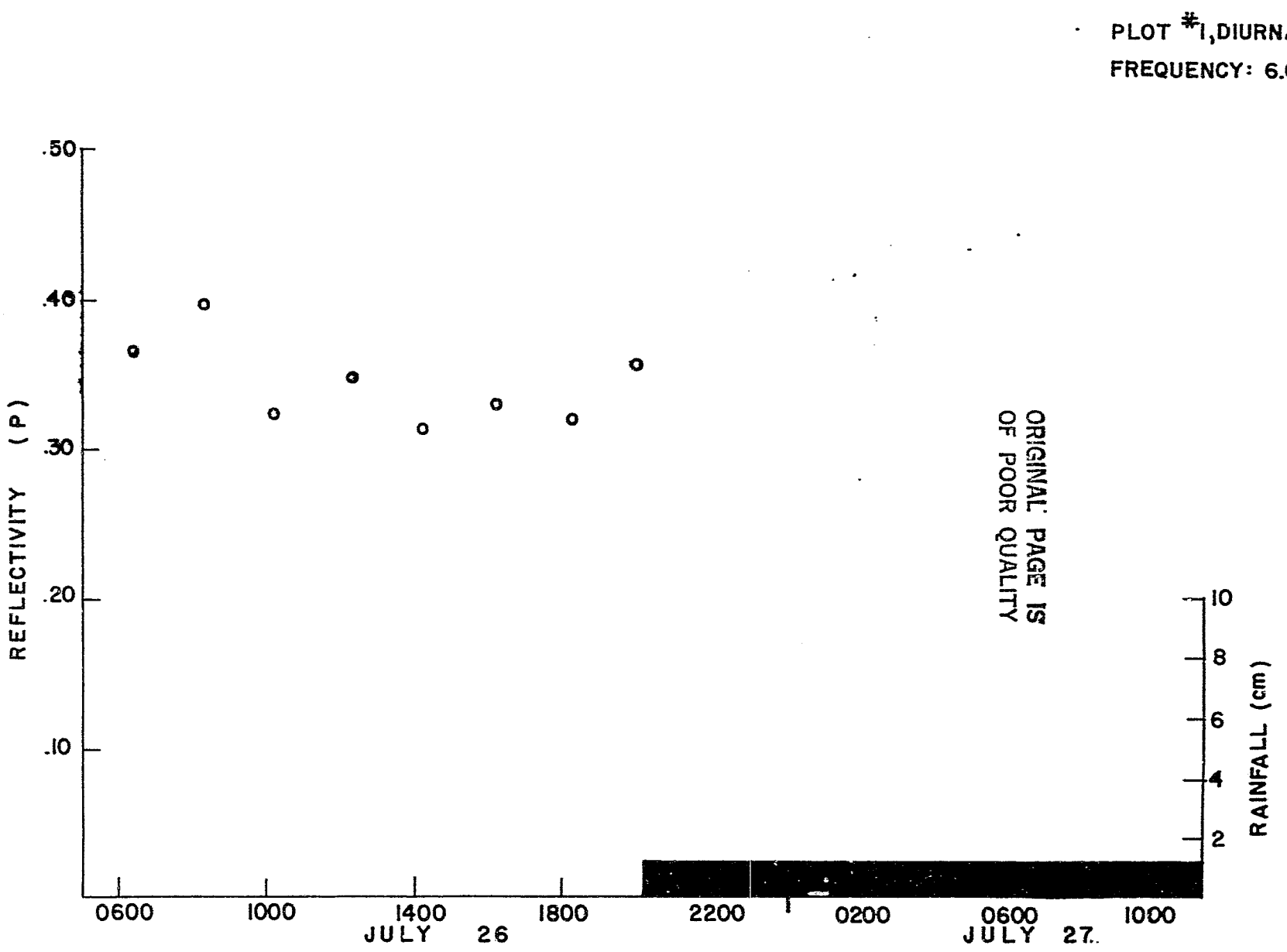

FIGURE 32. THE 6.0 Ghz REFLECTIVITY vs. TIME FOR THE DIURNAL CYCLE OF PLOT 1

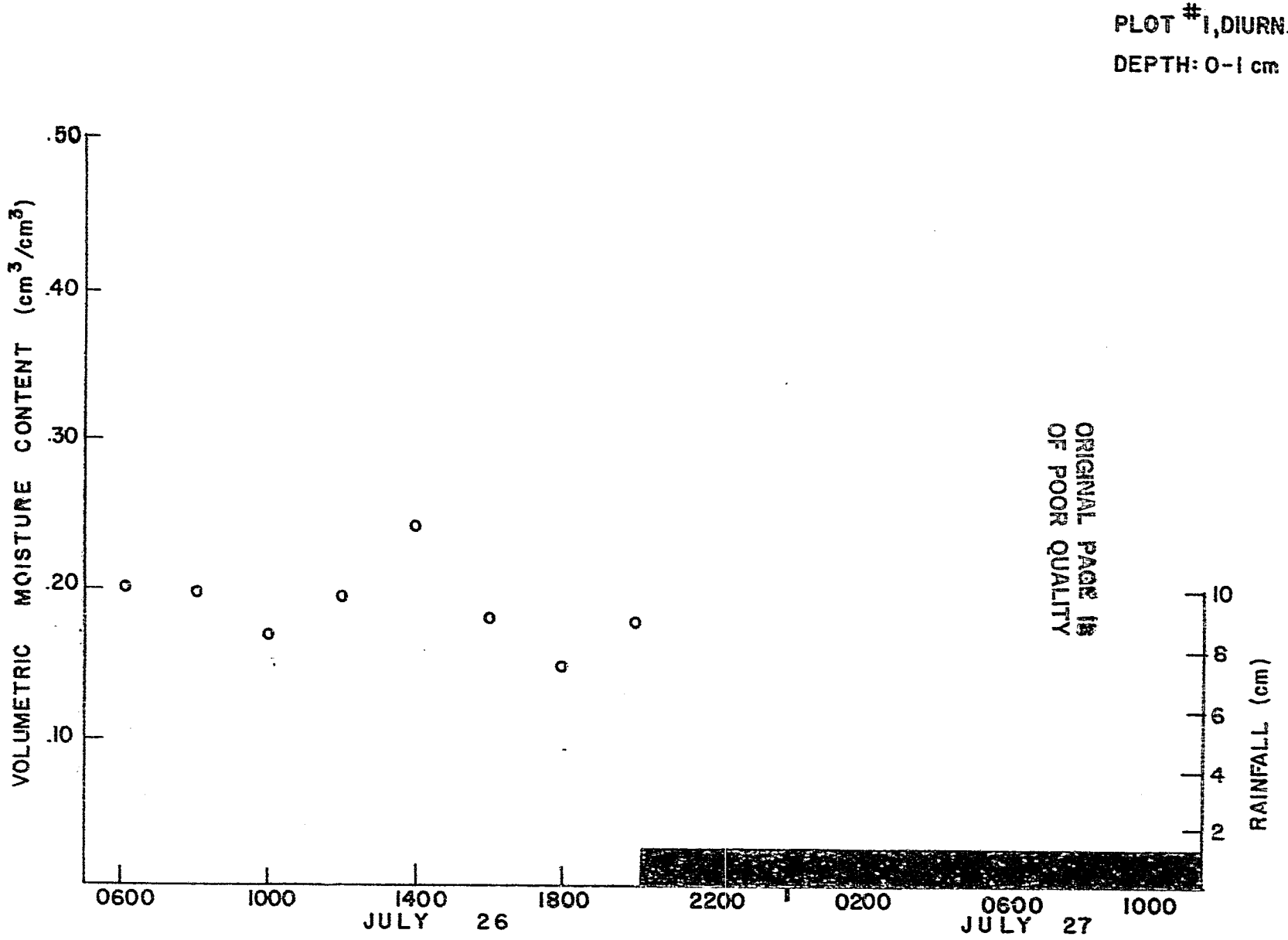

FIGURE 33. THE 0-1 CM VOLUMETRIC MOISTURE CONTENT vs. TIME FOR THE DIURNAL CYCLE OF PLOT 1

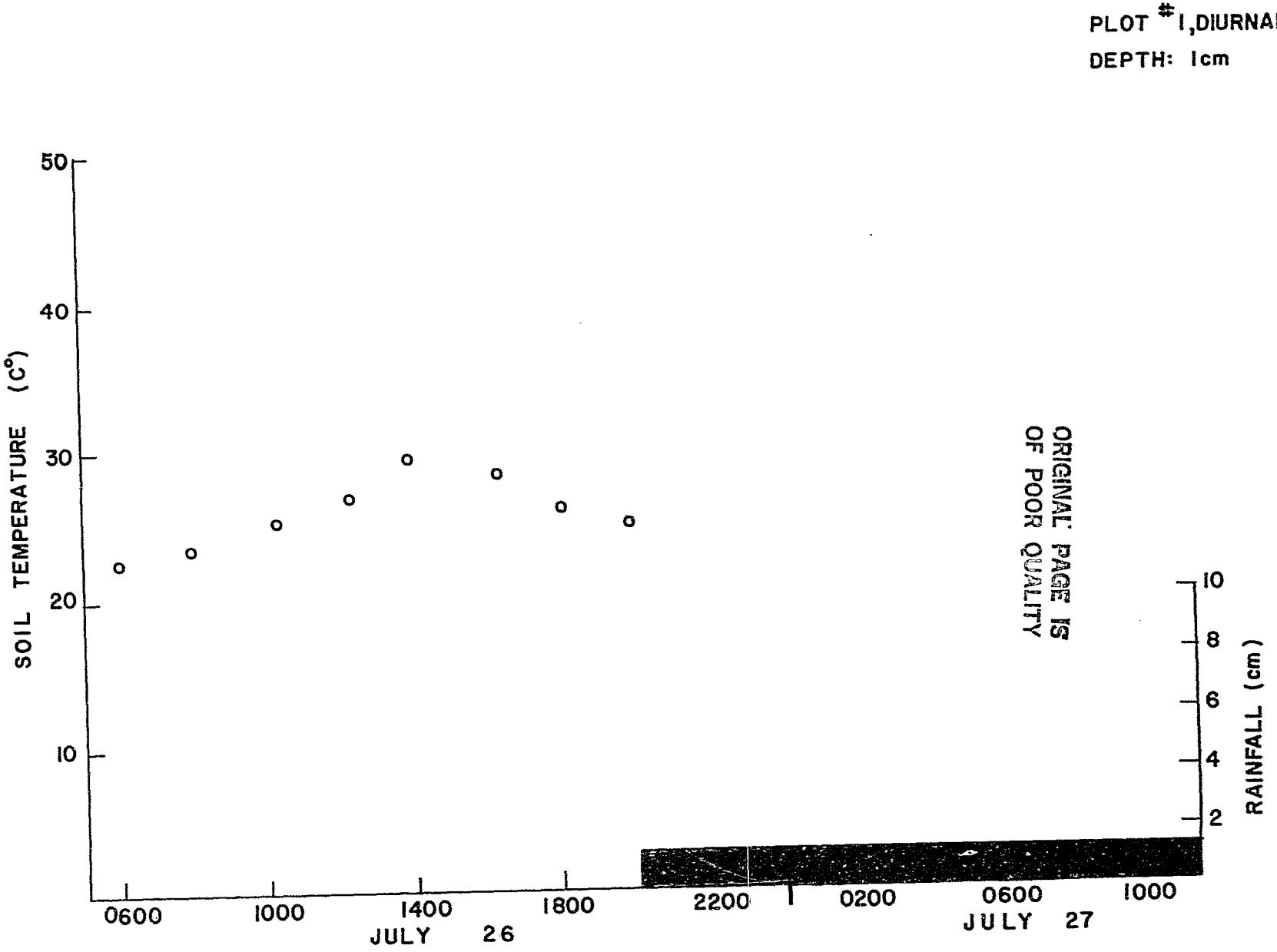

FIGURE 34. THE 1 CM SOIL TEMPERATURE vs. TIME FOR THE DIURNAL CYCLE OF PLOT 1

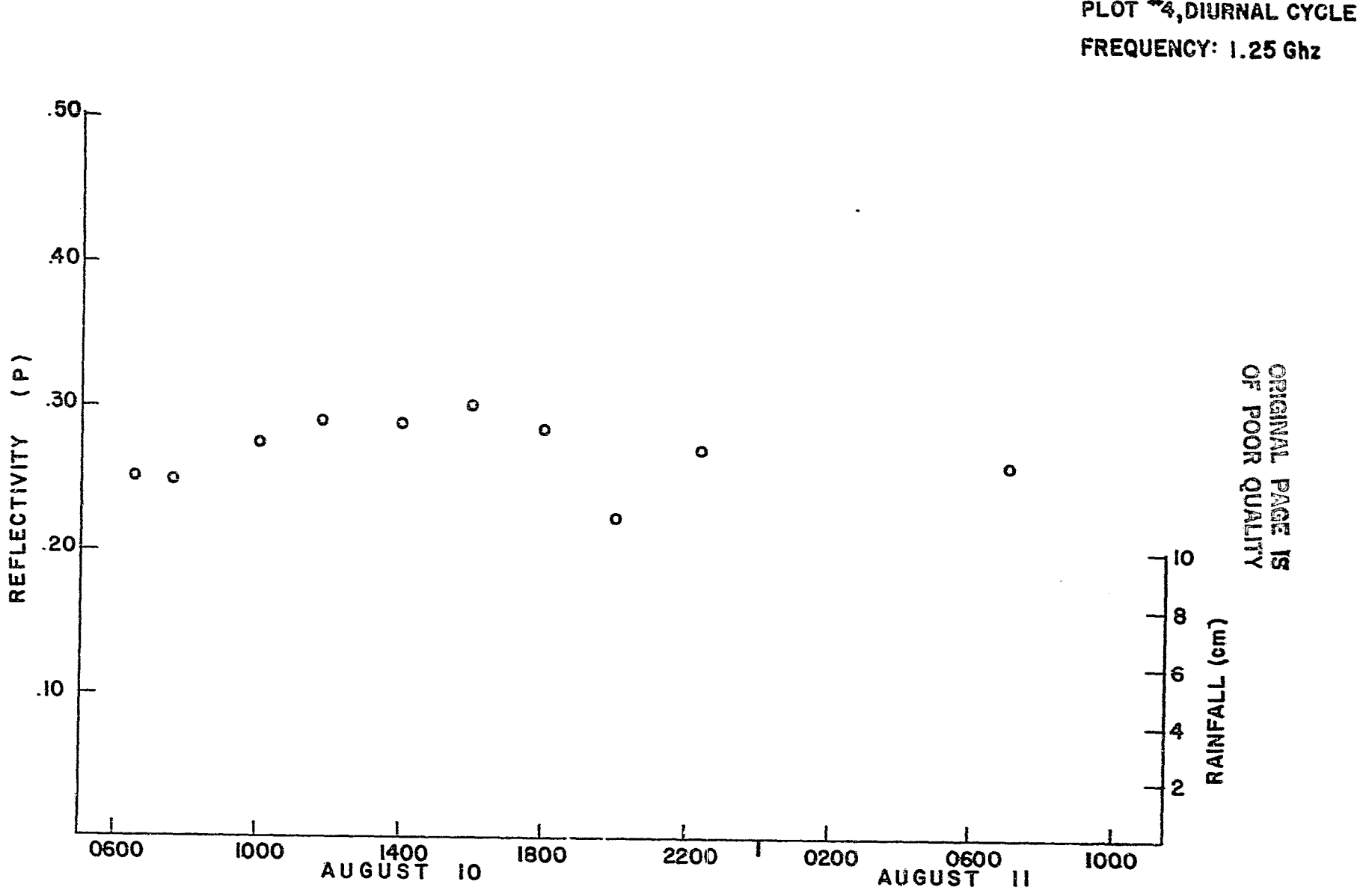

FIGURE 35. THE 1.25 Ghz REFLECTIVITY vs. TIME FOR THE DIURNAL CYCLE OF PLOT 4

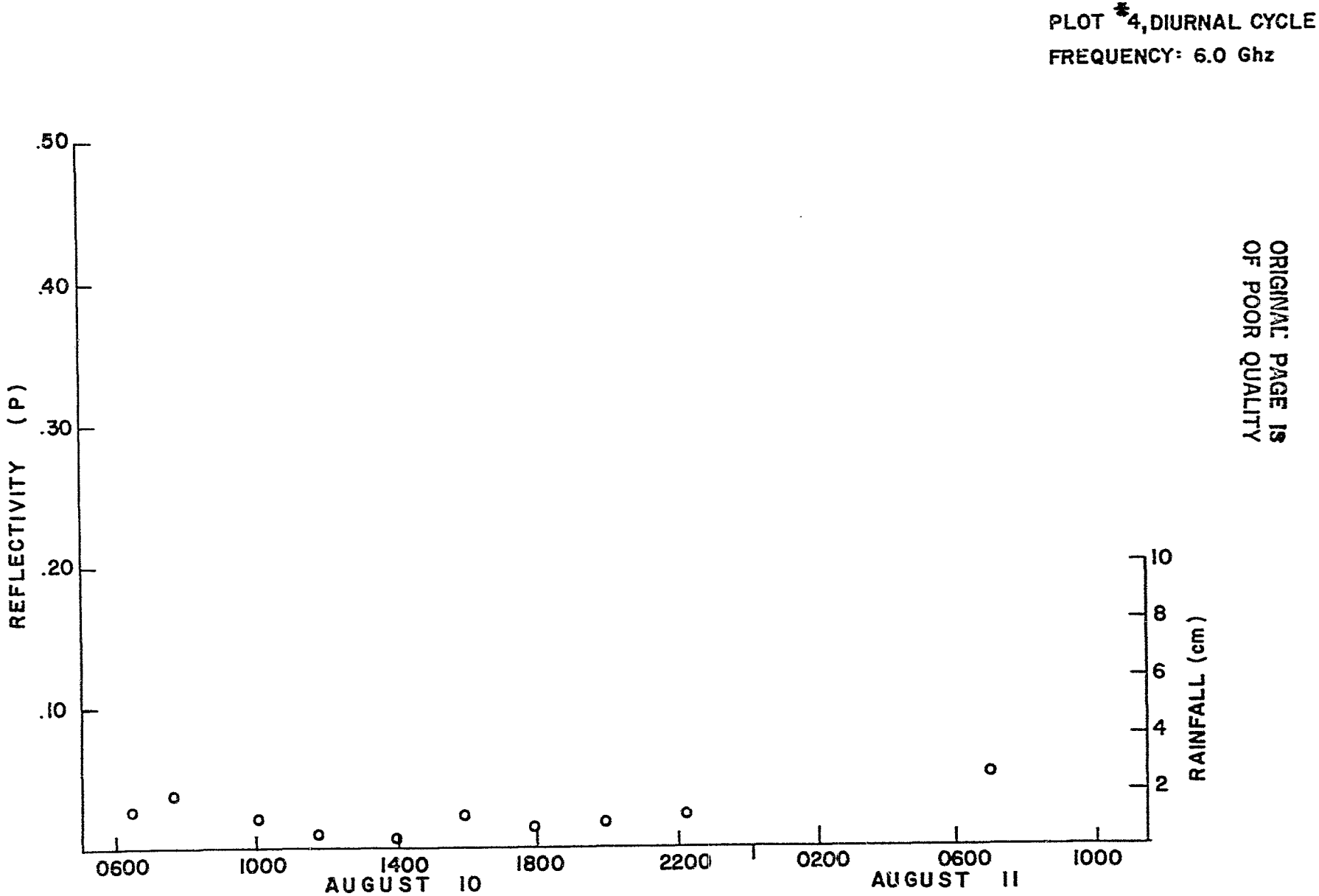

FIGURE 36. THE 6.0 Ghz REFLECTIVITY vs. TIME FOR THE DIURNAL CYCLE OF PLOT 4

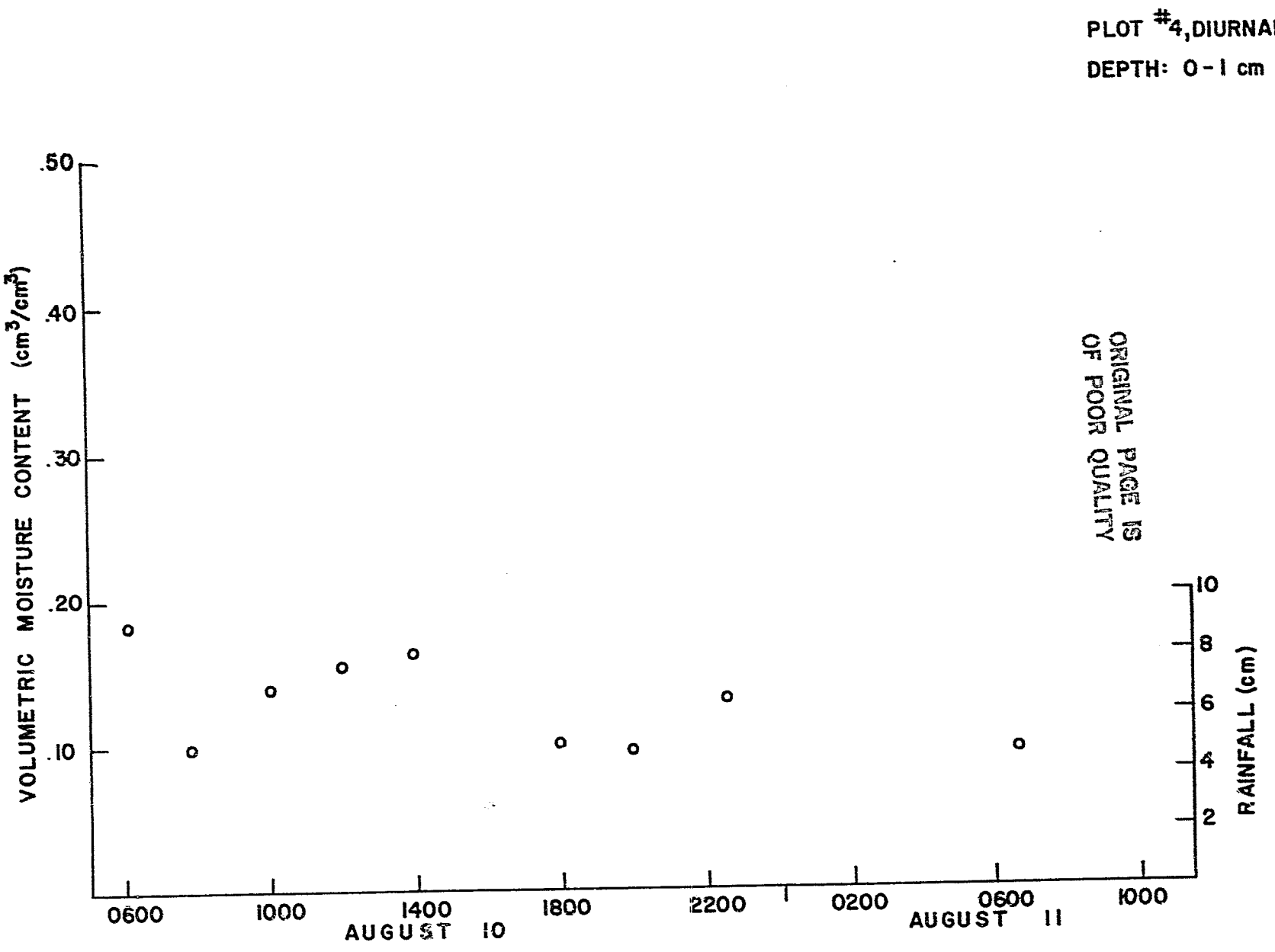

FIGURE 37. THE 0-1 CM DEPTH VOLUMETRIC SOIL MOISTURE CONTENT vs. TIME FOR THE DIURNAL CYCLE OF PLOT 4

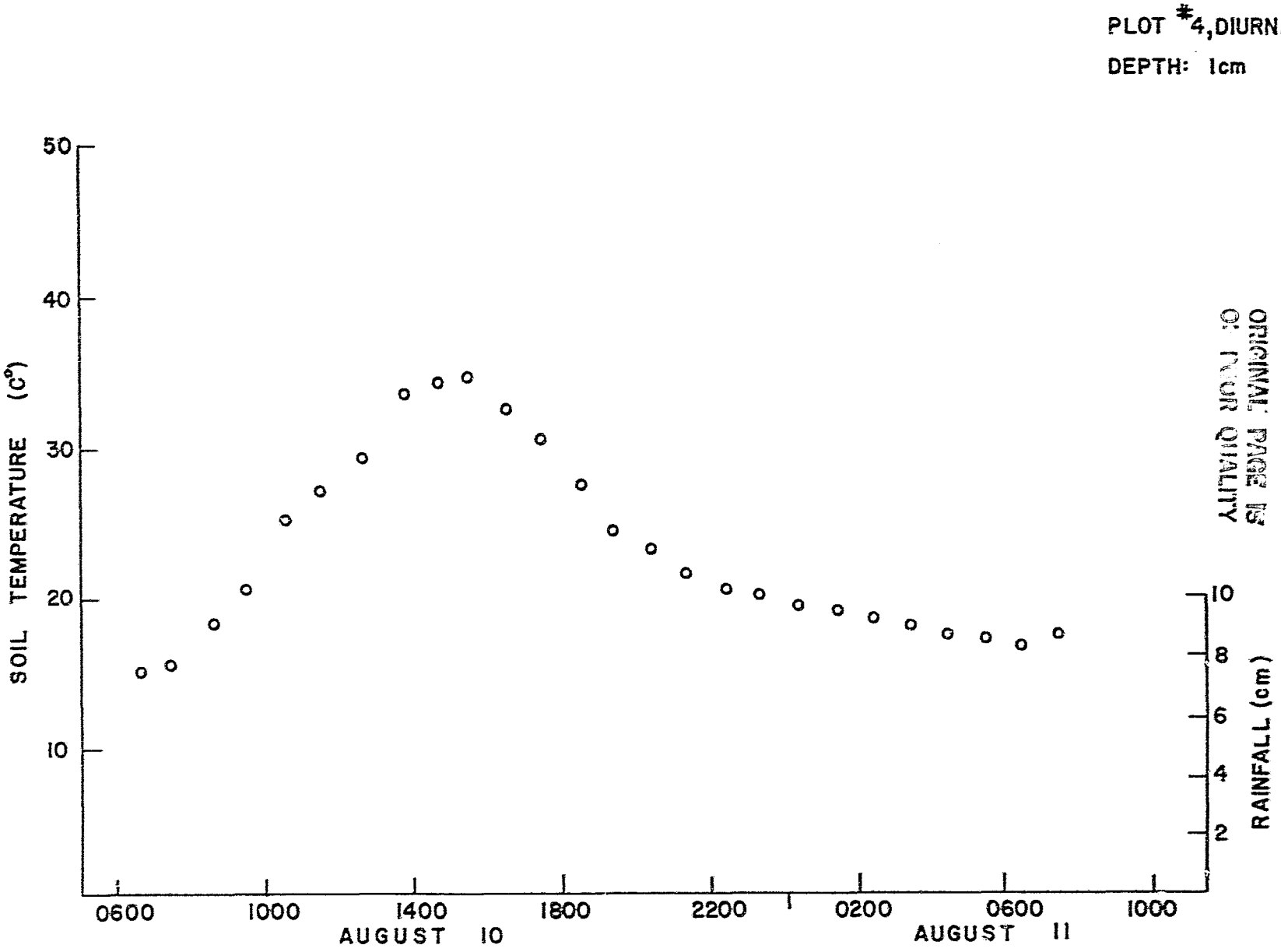

FIGURE 38. THE 1 CM DEPTH SOIL TEMPERATURE vs. TIME FOR THE DIURNAL CYCLE OF PLOT 4

REFERENCES

Waite, W. P.; Cook, K. R.; and Bryan, B. B.: "Broad Spectrum Microwave Systems for Remotely Measuring Soil Moisture Content". Water Resources Center Publication No. 18, University of Arkansas, 1973.

APPENDIX A

REFLECTIVITY MEASUREMENT RECORD

REFLECTIVITY MEASUREMENT RECORD

Plot #	Date	Time	Comments
1	7/9	1034	Rain ending at 0730.
		1230	
		1610	Light showers 1645.
	7/10	0900	
		1323	
		1605	
	7/11	0855	
		1315	
		1618	
	7/12	0905	
		1110	
		1320	
	7/13	0915	
		1300	
		1603	
	7/14	0835	
		1621	
	7/15	1600	
	7/16	0940	Thunder storms in the afternoon continuing through
		1117	7/17 .
	7/18	0900	
		1345	
		1635	
	7/19	0830	
		1400	
		1610	
	7/20	0845	
		1330	
		1615	
	7/21	0845	
		1615	
	7/22	1615	
	7/23	0900	
		1320	
		1615	

Plot #	Date	Time	Comments
1	7/24	0845	
		1345	
		1600	
	7/25	0920	
		1330	
		1620	
	7/26	0615	Began diurnal.
		0815	
		1000	
		1220	
		1405	
		1612	
		1755	Light rain starting at 2230 and continuing through
		2010	the night and next day.
	7/30	0855	
2	8/6	1145	
		1530	
	8/7	0930	
		1330	
		1620	
	8/8	0900	
		1350	
		1600	
	8/9	0940	
		1618	
	8/10	0915	Rain at 1630.
		1535	
	8/14	0920	
3	8/21	1120	Replaced Alfred Network Analyzer with H-P Network
		1121	Analyzer and storage normalizer.
		1600	
	8/22	0935	
		1315	
		1615	

Plot #	Date	Time	Comments
3	8/23	0900	Rain from 0430 to 0700.
		1330	
		1610	
	8/24	0845	
		1545	
	8/25	1415	
	8/26	1610	
	8/27	1010	Thunder showers in the afternoon.
	8/28	1410	Thunder showers in the morning.
	8/29	1445	
	8/30	1545	
	9/4	1045	Took bulk density to 30cm in center of plot.
4	9/6	1500	
	9/7	0920	
		1430	
	9/8	1435	
	9/9	1415	
	9/10	0635	Started diurnal.
		0735	
		1000	
		1145	
		1400	
		1605	
		1800	
		2005	
		2230	
	9/11	0705	
		1500	
	9/12	1515	Started less frequent measurement schedule.
	9/13	1535	
	9/14	1325	

Plot #	Date	Time	Comments
4	9/17	1435	
	9/19	1500	
5	9/21	1450	Rained 9/20. Further decreased measurements to twice a week.
	9/25	1510	
	9/28	1505	
	10/2	1505	
	10/5	1430	
	10/9	1525	
	10/12	1720	
	10/16	1500	Rained 9/15 from 1200 to 1520.
	10/19	1445	

APPENDIX B

RAINFALL DATA

RAINFALL (CM)

(Reported at the University of Arkansas Farm from July 1 to Oct. 22, 1979)

Date	Rainfall (CM)
7/1	5.08
7/2	.10
7/6	.71
7/7	.53
7/8	.20
7/9	.23
7/17	Trace
7/18	2.67
7/27	1.42
7/28	5.08
7/29	Trace
8/1	.48
8/4	.91
8/5	.05
8/11	1.35
8/12	Trace
8/15	.28
8/16	.05
8/21	.38
8/23	.74
8/28	.13
8/29	1.24
9/6	.05
9/20	Trace
9/21	1.32
10/16	.76
10/17	Trace
10/22	2.21

APPENDIX C

REFLECTIVITY DATA

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 1

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
7/9	1034	.589	.592	.631	.638	.627	.620	.610
	1230	.575	.562	.592	.596	.579	.562	.556
	1610	.611	.550	.610	.586	.569	.579	.562
7/10	900	.513	.556	.596	.603	.596	.589	.582
	1323	.507	.522	.566	.566	.566	.562	.550
	1605	.519	.501	.531	.525	.543	.531	.543
7/11	855	.543	.540	.576	.592	.575	.562	.569
	1315	.452	.442	.498	.501	.507	.513	.537
	1618	.513	.513	.543	.550	.537	.537	.537
7/12	905	.556	.550	.569	.569	.531	.507	.484
	1110	.543	.543	.575	.582	.575	.556	.556
	1320	.490	.495	.537	.546	.540	.553	.537
7/13	915	.569	.556	.569	.576	.562	.562	.550
	1300	.513	.531	.531	.543	.531	.543	.537
	1603	.525	.513	.543	.537	.519	.513	.495
7/14	835	.513	.519	.537	.543	.525	.525	.519
	1621	.490	.484	.507	.495	.468	.442	.427
7/15	1600	.484	.484	.513	.513	.490	.479	.470
7/16	940	.522	.516	.540	.537	.513	.504	.495
	1117	.504	.490	.528	.519	.498	.484	.490
7/18	900	.569	.556	.596	.606	.589	.572	.569
	1345	.559	.546	.579	.582	.575	.572	.582
	1635	.556	.556	.582	.569	.550	.550	.543

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 1

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
7/19	830	.540	.528	.553	.556	.534	.525	.519
	1400	.510	.510	.543	.543	.525	.531	.528
	1610	.501	.507	.534	.531	.519	.525	.525
7/20	845	.528	.525	.550	.550	.540	.531	.540
	1330	.476	.476	.513	.516	.495	.498	.501
	1615	.501	.504	.519	.522	.510	.507	.516
7/21	845	.513	.495	.525	.525	.516	.513	.513
	1615	.513	.507	.566	.559	.546	.537	.534
7/22	1615	.490	.490	.519	.522	.501	.495	.487
7/23	900	.501	.490	.510	.516	.498	.498	.510
	1320	.470	.479	.504	.504	.490	.476	.481
	1615	.481	.481	.507	.504	.476	.454	.462
7/24	845	.504	.507	.534	.525	.507	.495	.495
	1345	.437	.442	.487	.481	.452	.439	.437
	1600	.470	.462	.495	.484	.457	.439	.432
7/25	920	.479	.468	.525	.519	.493	.481	.473
	1330	.432	.424	.473	.468	.452	.437	.452
	1620	.434	.410	.439	.457	.442	.427	.432
7/26	615	.447	.429	.465	.473	.457	.447	.447
	815	.449	.417	.452	.452	.434	.417	.419
	1000	.454	.424	.465	.473	.468	.447	.460
	1220	.442	.437	.479	.468	.473	.457	.454
	1405	.439	.422	.470	.473	.468	.452	.462
	1612	.452	.437	.479	.479	.465	.457	.447
	1755	.427	.410	.454	.468	.452	.439	.444
	2010	.457	.439	.490	.490	.481	.479	.470
7/30	855	.501	.504	.550	.562	.575	.582	.592

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 1

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)					
DATE	TIME	5.0	5.5	6.0	6.5	7.0	7.5
7/9	1014	.537	.606	.596	.507	.490	.417
	1315	.638	.638	.582	.556	.490	.442
	1605	.585	.582	.575	.546	.513	.468
7/10	910	.550	.576	.501	.468	.481	.427
	1312	.585	.603	.603	.617	.585	.534
	1555	.617	.603	.575	.550	.513	.457
7/11	845	.575	.589	.569	.550	.537	.452
	1330	.543	.543	.550	.543	.490	.398
	1616	.550	.537	.507	.495	.490	.457
7/12	856	.575	.569	.537	.501	.495	.437
	1325	.624	.582	.531	.513	.519	.447
7/13	900	.575	.550	.519	.490	.468	.380
	1325	.589	.543	.484	.462	.442	.385
	1600	.543	.562	.556	.519	.479	.433
7/14	844	.589	.543	.490	.479	.462	.389
	1609	.398	.457	.447	.380	.372	.320

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 1

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)					
DATE	TIME	5.0	5.5	6.0	6.5	7.0	7.5
7/15	1610	.513	.507	.479	.452	.417	.367
7/16	840	.525	.501	.481	.457	.447	.410
	1120	.582	.562	.543	.510	.454	.391
7/18	845	.617	.582	.531	.513	.519	.479
	1400	.498	.495	.484	.462	.407	.347
	1615	.537	.556	.569	.550	.490	.412
7/19	845	.507	.513	.507	.465	.444	.394
	1330	.457	.465	.468	.449	.412	.372
	1630	.507	.487	.454	.427	.412	.376
7/20	830	.490	.510	.525	.490	.444	.376
	1340	.396	.410	.419	.391	.345	.295
	1600	.452	.468	.470	.452	.414	.407
7/21	850	.487	.519	.495	.447	.432	.374
	1600	.396	.389	.389	.374	.347	.313
7/22	1630	.403	.376	.343	.331	.313	.275
7/23	845	.410	.410	.387	.353	.331	.282
	1330	.351	.355	.361	.343	.299	.254
	1600	.318	.333	.337	.320	.280	.243
7/24	900	.394	.403	.391	.353	.329	.288
	1330	.376	.353	.325	.311	.307	.279
	1615	.374	.359	.355	.341	.331	.309
7/25	915	.417	.389	.369	.341	.318	.279
	1345	.361	.355	.351	.331	.320	.287
	1600	.309	.309	.316	.307	.283	.256
7/26	620	.335	.351	.367	.351	.320	.259
	810	.374	.398	.398	.367	.361	.339
	1005	.355	.351	.324	.300	.292	.259
	1215	.359	.361	.351	.316	.295	.269
	1410	.341	.327	.316	.307	.299	.280
	1605	.365	.347	.331	.313	.307	.287
	1810	.341	.341	.322	.302	.316	.311
	2000	.324	.355	.359	.313	.304	.292
7/30	905	.498	.516	.504	.465	.427	.382

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 2

POLARIZATION: H
INCIDENCE ANGLE: 45^{o}

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
8/6	1145	.262	.259	.292	.318	.302	.295	.280
	1530	.274	.255	.288	.306	.274	.256	.233
8/7	0930	.235	.235	.260	.285	.268	.253	.243
	1330	.253	.247	.282	.304	.277	.260	.240
	1620	.220	.214	.243	.259	.230	.214	.197
8/8	0900	.228	.231	.248	.272	.251	.237	.219
	1350	.216	.209	.232	.247	.218	.197	.180
	1600	.193	.193	.221	.229	.205	.186	.172
8/9	0940	.207	.213	.229	.232	.210	.198	.183
	1618	.175	.173	.188	.196	.175	.154	.135
8/10	0915	.193	.197	.209	.214	.191	.177	.159
	1535	.168	.166	.184	.187	.164	.144	.125
8/14	0920	.156	.266	.314	.337	.320	.300	.275

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 2

POLARIZATION: H
INCIDENCE ANGLE: 45°.

DATE	TIME	FREQUENCY (GHz) 5.0	5.5	6.0	6.5	7.0	7.5
8/6	1135	.289	.186	.130	.142	.156	.166
	1530	.016	.010	<.003	<.003	<.002	.009
	1600	.010	<.005	<.004	<.003	.015	.318
8/7	0930	.053	.055	.051	.041	.035	.028
	1330	<.036	<.027	.034	.050	.066	.075
	1608	<.026	.028	.041	.057	.069	.082
8/8	0900	.039	.038	.035	.030	.030	.029
	1340	.030	.051	.077	.108	.131	.128
	1600	.068	.087	.109	.129	.139	.134
8/9	0930	.058	.062	.067	.069	.067	.068
	1630	.122	.109	.108	.110	.107	.094
8/10	0905	.133	.123	.123	.127	.127	.124
	1545	.171	.152	.150	.147	.134	.119
8/14	0915	.305	.299	.265	.248	.234	.205

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 3

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
8/21	1121	.162	.178	.204	.213	.185	.161	.142
	1600	.191	.218	.254	.285	.268	.247	.215
8/22	0935	.223	.259	.269	.304	.289	.271	.247
	1315	.180	.184	.216	.277	.269	.253	.224
	1615	.145	.171	.195	.222	.210	.191	.166
8/23	0900	.401	.449	.490	.525	.537	.531	.525
	1330	.266	.309	.355	.380	.382	.376	.370
	1610	.252	.281	.329	.355	.347	.343	.320
8/24	0845	.263	.302	.343	.370	.359	.355	.347
	1545	.213	.249	.285	.324	.307	.292	.274
8/25	1415	.189	.227	.252	.299	.294	.279	.256
8/26	1610	.181	.214	.246	.269	.262	.250	.232
8/27	1010	.189	.227	.256	.277	.266	.250	.236
8/28	1410	.432	.479	.534	.589	.589	.582	.589
8/29	1445	.221	.256	.295	.328	.314	.302	.292
8/30	1545	.223	.254	.285	.313	.294	.287	.253
9/4	1045	.194	.219	.257	.247	.232	.215	.218

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 3

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)					
DATE	TIME	5.0	5.5	6.0	6.5	7.0	7.5
8/21	1130	.193	.138	.100	.101	.099	.091
	1610	.026	.011	.007	.004	.006	.012
8/22	0915	.031	.023	.023	.028	.035	.031
	1330	.007	.002	.002	.009	.024	.039
	1610	.009	.007	.012	.025	.049	.060
8/23	0900	.282	.288	.251	.224	.213	.200
	1330	.279	.272	.251	.240	.235	.221
	1620	.186	.174	.172	.172	.172	.153
8/24	0840	.246	.254	.229	.207	.207	.185
	1545	.072	.052	.042	.035	.039	.035
8/25	1415	.032	.019	.015	.015	.025	.032
8/26	1620	.032	.019	.020	.020	.031	.046
8/27	1000	.060	.048	.043	.035	.036	.039
8/28	1415	.513	.465	.457	.479	.519	.519
8/29	1445	.263	.254	.262	.288	.350	.355
8/30	1545	.142	.120	.114	.112	.112	.115
9/04	1040	.143	.136	.118	.130	.132	.127

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 4

POLARIZATION: H

INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
09/06	1500	.399	.325	.328	.297	.249	.228	.217
09/07	0920	.242	.236	.256	.263	.243	.225	.203
	1430	.254	.252	.291	.299	.287	.279	.256
09/08	1435	.269	.279	.324	.357	.351	.343	.318
09/09	1415	.287	.305	.355	.385	.378	.363	.327
09/10	0635	.247	.253	.296	.309	.307	.299	.268
	0735	.251	.250	.276	.285	.274	.260	.231
	1000	.266	.276	.317	.355	.355	.343	.336
	1145	.271	.291	.341	.376	.376	.396	.394
	1400	.276	.289	.335	.363	.363	.345	.307
	1605	.292	.303	.355	.383	.385	.378	.339
	1800	.277	.286	.349	.385	.387	.380	.332
	2005	.218	.224	.269	.299	.304	.301	.289
	2230	.260	.273	.324	.353	.363	.359	.346
09/11	0705	.254	.263	.304	.320	.322	.322	.280
	1500	.299	.307	.366	.362	.335	.317	.272
09/12	1515	.287	.297	.341	.326	.306	.289	.248
09/13	1535	.299	.328	.387	.401	.409	.366	.313

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 4 POLARIZATION: H

INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
09/14	1325	.280	.304	.364	.387	.370	.349	.309
09/17	1435	.304	.319	.360	.376	.376	.372	.330
09/19	1500	.313	.317	.356	.380	.363	.367	.331

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 4 POLARIZATION: H

INCIDENCE ANGLE: 45

DATE	TIME	FREQUENCY (GHz) 5.0	5.5	6.0	6.5	7.0	7.5
9/06	1505	6.55×10^{-2}	5.21×10^{-2}	4.11×10^{-2}	3.43×10^{-2}	2.35×10^{-2}	1.26×10^{-2}
9/07	0910	5.89×10^{-2}	6.17×10^{-2}	4.45×10^{-2}	3.57×10^{-2}	2.57×10^{-2}	1.68×10^{-2}
	1435	2.00×10^{-2}	1.28×10^{-2}	8.22×10^{-3}	6.24×10^{-3}	3.70×10^{-3}	5.83×10^{-4}
9/08	1440	1.72×10^{-2}	1.18×10^{-2}	7.49×10^{-3}	4.93×10^{-3}	2.82×10^{-3}	8.22×10^{-4}
9/09	1420	7.47×10^{-3}	4.10×10^{-3}	1.70×10^{-3}	3.76×10^{-4}	2.24×10^{-3}	1.5×10^{-2}
9/10	0630	3.35×10^{-2}	3.27×10^{-2}	2.47×10^{-2}	2.32×10^{-2}	2.10×10^{-2}	2.32×10^{-2}
	0730	3.35×10^{-2}	3.43×10^{-2}	3.57×10^{-2}	3.20×10^{-2}	2.20×10^{-2}	2.09×10^{-2}
	1005	2.99×10^{-2}	2.20×10^{-2}	1.98×10^{-2}	1.77×10^{-2}	1.08×10^{-2}	1.04×10^{-2}
	1145	2.25×10^{-2}	1.20×10^{-2}	6.43×10^{-3}	4.17×10^{-3}	8.71×10^{-4}	2.79×10^{-3}
	1405	1.48×10^{-2}	9.13×10^{-3}	1.10×10^{-3}	9.55×10^{-3}	3.89×10^{-3}	5.56×10^{-3}
	1600	6.35×10^{-2}	7.08×10^{-2}	2.19×10^{-2}	2.62×10^{-2}	1.49×10^{-2}	1.12×10^{-2}
	1805	1.59×10^{-2}	8.32×10^{-3}	1.26×10^{-2}	1.37×10^{-2}	1.07×10^{-2}	8.56×10^{-3}
	2000	2.08×10^{-2}	1.68×10^{-2}	1.94×10^{-2}	1.85×10^{-2}	1.48×10^{-2}	1.53×10^{-2}
	2235	2.90×10^{-2}	2.09×10^{-2}	2.32×10^{-2}	2.35×10^{-2}	1.73×10^{-2}	1.32×10^{-2}
9/11	0700	5.31×10^{-2}	5.19×10^{-2}	5.34×10^{-2}	6.03×10^{-2}	5.10×10^{-2}	4.44×10^{-2}
	1505	1.68×10^{-2}	8.32×10^{-3}	8.09×10^{-3}	6.31×10^{-3}	6.81×10^{-3}	1.04×10^{-2}
9/12	1600	2.46×10^{-2}	1.10×10^{-2}	7.12×10^{-2}	7.87×10^{-3}	7.86×10^{-3}	7.86×10^{-3}
9/13	1530	3.31×10^{-2}	2.09×10^{-2}	2.40×10^{-2}	2.11×10^{-2}	2.09×10^{-2}	1.91×10^{-2}
9/14	1345	3.04×10^{-2}	1.93×10^{-2}	1.86×10^{-2}	1.12×10^{-2}	3.89×10^{-3}	4.68×10^{-3}

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 4

POLARIZATION: H

INCIDENCE ANGLE: 45

		FREQUENCY (GHz)					
DATE	TIME	5.0	5.5	6.0	6.5	7.0	7.5
9/17	1430	2.69×10^{-2}	1.95×10^{-2}	2.12×10^{-2}	1.32×10^{-2}	1.40×10^{-2}	1.07×10^{-2}
9/19	1505	2.33×10^{-2}	2.48×10^{-2}	2.71×10^{-2}	1.82×10^{-2}	1.16×10^{-2}	8.00×10^{-3}

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 5

POLARIZATION: H
INCIDENCE ANGLE: 45°

		FREQUENCY (GHz)						
DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
09-21	1450	.367	.408	.447	.479	.452	.415	.370
09-25	1510	.306	.313	.355	.363	.337	.322	.294
09-28	1505	.285	.282	.306	.311	.307	.316	.320
10-02	1505	.260	.281	.302	.306	.269	.259	.257
10-05	1430	.245	.256	.284	.300	.284	.282	.274
10-09	1525	.207	.224	.241	.266	.265	.254	.241
10-12	1720	.197	.215	.239	.268	.274	.250	.223
10-16	1500	.299	.308	.333	.345	.326	.307	.292
10-19	1445	.222	.240	.260	.272	.253	.231	.225

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 5

POLARIZATION: H

INCIDENCE ANGLE: 45^{o}

		FREQUENCY (GHz)					
DATE	TIME	5.0	5.5	6.0	6.5	7.0	7.5
09-21	1445	.263	.229	.193	.154	.145	.118
09-25	1515	3.24×10^{-2}	2.80×10^{-2}	2.65×10^{-2}	2.07×10^{-2}	1.15×10^{-2}	3.94×10^{-3}
09-28	1520	8.47×10^{-4}	9.45×10^{-5}	4.88×10^{-4}	6.88×10^{-3}	1.38×10^{-2}	3.37×10^{-2}
10-02	1510	9.77×10^{-3}	1.08×10^{-2}	7.77×10^{-3}	7.41×10^{-4}	2.01×10^{-3}	1.06×10^{-2}
10-05	1420	1.23×10^{-2}	1.02×10^{-2}	6.17×10^{-3}	3.47×10^{-4}	6.96×10^{-3}	2.69×10^{-2}
10-09	1530	2.29×10^{-2}	1.57×10^{-2}	9.95×10^{-3}	8.32×10^{-3}	8.81×10^{-3}	1.02×10^{-2}
10-12	1710	2.76×10^{-2}	1.27×10^{-2}	1.02×10^{-2}	6.46×10^{-3}	9.12×10^{-3}	5.82×10^{-3}
10-16	1510	.123	7.00×10^{-2}	5.07×10^{-2}	2.40×10^{-2}	2.10×10^{-2}	1.36×10^{-2}
10-19	1440	6.77×10^{-3}	3.48×10^{-3}	2.73×10^{-3}	2.00×10^{-4}	1.97×10^{-3}	9.73×10^{-4}

APPENDIX D

GRAVIMETRIC MOISTURE DATA

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT Θ_w (GM/GM)

Plot No. 1 Date: 7/09/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1000	I	.364	.292	.270	.261	.292	.280	.295
	II	.386	.267	.265	.262	.295	.242	.282
	III	.272	.226	.213	.223	.234	.245	.243
	IV	.311	.239	.236	.221	.252	.224	.231
Plot mean		.329	.256	.246	.242	.268	.248	.263
1200	I	-----	.200	.164	.167	.177	.182	.237
	II	.277	.233	.287	.193	.248	.225	.245
	III	.250	.250	.233	.214	.237	.186	.190
	IV	.308	.214	.175	.188	.224	.210	.220
Plot mean		.278	.224	.215	.191	.221	.201	.223
1600	I	.342	.257	.242	.206	.262	.236	.249
	II	.305	.315	.247	.233	.275	.218	.208
	III	.260	.216	.190	.184	.213	.182	.185
	IV	.301	.201	.204	.194	.225	.204	.239
Plot mean		.287	.247	.221	.204	.244	.210	.220

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/10/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.440	.271	.246	.240	.299	.242	.253
	II	.293	.270	.211	.250	.256	.242	.208
	III	.248	.229	.184	.152	.203	.185	.210
	IV	.280	.219	.212	.197	.227	.213	.204
Plot mean		.315	.247	.213	.210	.246	.221	.219
1300	I	.316	.268	.257	.282	.281	.208	.214
	II	.216	.184	.151	.120	.168	.197	.109
	III	.309	.273	.168	.188	.235	.171	.215
	IV	.231	.195	.177	.181	.196	.215	.200
Plot mean		.268	.230	.188	.193	.220	.198	.205
1600	I	.396	.307	----	.180	.296	.207	.220
	II	.212	.273	.313	.271	.267	.217	.201
	III	.316	.250	.259	.224	.262	.208	.216
	IV	.238	.206	.187	.202	.208	.196	.197
Plot mean		.291	.259	.253	.219	.258	.207	.209

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/11/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.284	.288	----	.210	.260	.188	.222
	II	.231	.244	.209	.245	.232	.236	.207
	III	.261	.246	.226	.161	.224	.205	.217
	IV	.319	.200	.212	.189	.230	.199	.199
Plot mean		.274	.195	.216	.201	.237	.207	.211
1300	I	.346	.353	.199	.151	.262	.211	.212
	II	.221	.208	.199	.331	.239	.233	.207
	III	.172	.145	.190	.169	.169	.169	.177
	IV	.159	.174	.179	.144	.164	.160	.176
Plot mean		.225	.220	.192	.199	.209	.193	.193
1600	I	.268	.179	.129	.230	.202	.206	.223
	II	.263	.230	.170	----	.221	.189	.185
	III	.183	.177	.129	.130	.155	.132	.181
	IV	----	.114	.153	.137	.135	.171	.177
Plot mean		.238	.175	.145	.166	.178	.175	.192

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/12/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.272	.295	----	.141	.236	.165	.224
	II	.252	.237	.211	.203	.226	.223	.223
	III	.185	.219	.179	.209	.198	.190	.207
	IV	.258	.191	.203	.161	.203	.183	.180
Plot mean		.242	.236	.198	.179	.216	.190	.209
1300	I	.156	.098	.147	.177	.145	.165	.173
	II	.126	.168	.134	.117	.136	.156	.162
	III	.097	.199	.077	.104	.119	.173	.187
	IV	.090	.143	.138	.135	.127	.166	.192
Plot mean		.117	.152	.124	.133	.132	.165	.179
1600	I	.209	.151	.087	.150	.149	.321	.203
	II	.176	.261	.107	.166	.176	.276	.178
	III	.039	.141	.245	.263	.173	.203	.194
	IV	.152	.089	.096	.097	.109	.138	.156
Plot mean		.144	.161	.134	.169	.152	.234	.183

C-2

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/13/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.209	.163	.086	----	.153	.205	.214
	II	.272	.374	.261	.216	.281	.023	----
	III	.158	.257	.241	.230	.222	.210	.184
	IV	.228	.203	.195	.205	.208	.195	.171
Plot mean		.217	.249	.196	.217	.216	.158	.190
1300	I	.241	.170	.134	.137	.171	.169	.169
	II	.256	.270	.294	----	.273	.204	.195
	III	.093	.131	----	.123	.116	.150	.168
	IV	.103	.094	.118	.134	.112	.153	.175
Plot mean		.173	.166	.182	.131	.168	.169	.177
1600	I	.213	.081	.150	.109	.138	.170	.188
	II	.204	.180	.140	.161	.171	.189	.186
	III	.079	.082	.087	.120	.092	.140	.157
	IV	.041	.099	.119	.172	.108	.096	.175
Plot mean		.134	.111	.124	.141	.127	.149	.177

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/14/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.284	.063	.104	.177	.158	.202	.188
	II	.140	.090	.124	.132	.120	.149	.190
	III	.058	.061	.067	.155	.087	.156	.162
	IV	.098	.074	.087	.123	.095	.123	.167
Plot mean		.145	.072	.096	.147	.115	.158	.178

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/16/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.317	.153	.176	.159	.201	.165	.194
	II	.206	.229	.189	.118	.186	.231	.191
	III	.141	.129	.139	.126	.134	.152	.162
	IV	.130	.141	.121	.141	.132	.136	.160
Plot mean		.199	.163	.156	.136	.163	.171	.177

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/17/79

Time	Quad	DEPTH INTERVAL (CM) 0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0830	I	.279	.283	.197	.224	.246	.222	.218
	II	.291	.241	.227	.216	.244	.228	.188
	III	.286	.202	.190	.169	.212	.178	.192
	IV	.340	.271	.290	.251	.288	.237	.269
Plot mean		.299	.249	.226	.215	.247	.216	.217

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w(GM/GM)

Plot No. 1 Date: 7/18/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.275	.179	----	.170	.208	.192	.205
	II	.233	.206	.176	.162	.194	.183	.184
	III	.207	.215	.235	.167	.206	.181	.202
	IV	.250	.203	.212	.174	.210	.235	.209
Plot mean		.241	.201	.208	.168	.205	.198	.200
1340	I	.212	.147	.146	.132	.159	.208	.207
	II	.203	.199	.152	.176	.183	.195	.180
	III	.183	.168	.192	.200	.186	.194	.186
	IV	.281	.196	.211	.185	.218	.191	.181
Plot mean		.220	.178	.175	.173	.186	.197	.189
1600	I	.196	.169	.207	.163	.184	.204	.217
	II	.149	.149	.151	.148	.149	.181	.202
	III	.215	.163	.143	.122	.161	.125	.193
	IV	.194	.081	.119	.105	.125	.170	.173
Plot mean		.189	.141	.155	.135	.155	.170	.196

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w(GM/GM)

Plot No. 1 Date: 7/19/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.213	.170	.160	.159	.176	.210	.211
	II	.348	.255	.285	.191	.270	.199	.222
	III	----	----	.202	.188	.195	.184	.183
	IV	.211	.181	.148	.135	.170	.176	.194
Plot mean		.257	.202	.199	.208	.202	.192	.203
1350	I	.202	.124	.142	.169	.159	.189	.177
	II	.192	.200	.205	.172	.192	.176	.208
	III	.139	.137	.162	.154	.148	.184	.172
	IV	.304	.199	.199	.180	.221	.219	.217
Plot mean		.209	.165	.177	.169	.180	.192	.194
1600	I	.162	.119	.165	.214	.165	.251	.179
	II	.196	.170	.192	.234	.198	.286	.189
	III	.150	.148	.084	.122	.126	.153	.178
	IV	.205	.150	.116	.156	.157	.158	.165
Plot mean		.178	.147	.139	.182	.161	.212	.178

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/20/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1300	I	.265	.151	.128	.153	.174	.178	.195
	II	.275	.176	.193	.172	.204	.174	.203
	III	.106	.146	.110	.114	.119	.142	.171
	IV	.132	.077	.096	.107	.103	.147	.174
Plot mean		.193	.138	.132	.137	.150	.160	.186

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/23/79

Time	Quad	DEPTH INTERVAL (CM) 0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0800	I	.085	.106	.160	.073	.159	.117	.172
	II	.213	.158	.173	.150	.174	.178	.180
	III	.111	.145	.121	.144	.130	.147	.151
	IV	.081	.065	.099	.122	.092	.141	.163
Plot mean		.123	.119	.138	.122	.139	.146	.167
1300	I	.025	.068	.090	.083	.067	.148	.160
	II	.208	.180	.153	.171	.178	.187	.176
	III	.075	.151	.144	.102	.118	.155	.172
	IV	.033	.047	.123	.111	.079	.148	.140
Plot mean		.085	.112	.128	.117	.110	.160	.162
1600	I	.016	.025	.121	.130	.073	.162	.180
	II	.023	.060	.208	.076	.092	.129	.173
	III	.024	.081	.099	.082	.072	.126	.158
	IV	.033	.217	.222	.119	.148	.129	.153
Plot mean		.024	.095	.163	.102	.096	.137	.166

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w(GM/GM)

Plot No. 1 Date: 7/24/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.039	.107	.069	.094	.077	.119	.136
	II	.230	.168	.226	.137	.190	.189	.186
	III	.093	.105	.140	.143	.120	.164	.167
	IV	.118	.125	.120	.124	.122	.160	.169
Plot mean		.120	.126	.139	.125	.127	.158	.165
1330	I	-----	.063	.090	.073	.073	.125	.137
	II	.263	.085	.092	.109	.137	.161	.175
	III	.044	.052	.141	.064	.075	.079	.142
	IV	.018	.109	.073	.085	.071	.133	.142
Plot mean		.108	.077	.099	.083	.090	.125	.149
1600	I	.010	.008	.033	.056	.024	.096	.137
	II	.160	.156	.180	.148	.161	.170	.181
	III	-----	.103	.073	.122	.099	.147	.158
	IV	.035	.058	.052	.091	.059	.110	.127
Plot mean		.065	.081	.085	.104	.086	.131	.151

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/25/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0830	I	.002	.007	.124	.086	.072	.153	.157
	II	.188	----	----	.150	.169	.168	.184
	III	.197	.121	.132	.205	.164	.164	.172
	IV	.052	.122	.092	.172	.111	.152	.183
Plot mean		.110	.107	.116	.153	.129	.159	.174
1600	I	.025	.076	.077	.117	.074	.147	.152
	II	.173	.154	.161	.159	.162	.162	.166
	III	.036	.109	.129	.130	.101	.113	.156
	IV	.026	.069	.132	.131	.090	.145	.158
Plot mean		.065	.102	.125	.134	.107	.142	.158

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/26/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0600	I	.181	.094	.153	.141	.142	.156	----
	II	.136	.129	.171	.224	.165	.235	.160
	III	.089	.150	.097	.129	.116	.155	.162
	IV	.078	.102	.144	----	.108	.129	.147
Plot mean		.121	.119	.141	.165	.133	.169	.156
0800	I	.104	.046	.072	.080	.076	.133	.130
	II	.171	.145	.178	.172	.167	.145	.155
	III	.210	.223	.118	.085	.159	.167	.165
	IV	.056	.142	.146	.153	.124	.154	.147
Plot mean		.135	.139	.129	.123	.131	.150	.149
1000	I	.043	.094	.075	.086	.075	.164	----
	II	.160	.179	.153	.168	.165	.106	.149
	III	.075	.162	.161	.116	.129	.148	.160
	IV	.023	.057	.118	.134	.083	.152	.160
Plot mean		.075	.123	.127	.126	.113	.143	.156

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/26/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1200	I	.098	.109	.208	.074	.122	.139	.169
	II	.198	.137	.183	.171	.172	-----	-----
	III	.054	.141	.121	.126	.111	.167	.231
	IV	.120	.099	.117	.107	.111	.135	.145
Plot mean		.118	.122	.157	.120	.129	.147	.182
1400	I	.070	.113	.106	.174	.116	.160	.163
	II	.229	.255	.186	.197	.217	.222	.156
	III	.104	.174	.222	.188	.172	.194	.165
	IV	.113	.154	.147	.149	.141	.168	.157
Plot mean		.129	.174	.165	.177	.161	.186	.160
1600	I	.128	-----	.179	-----	.154	.163	.145
	II	.112	.133	.134	.147	.132	.196	.221
	III	.015	.039	.084	.147	.071	.142	.157
	IV	.176	.085	.105	.110	.119	.143	.143
Plot mean		.108	.086	.126	.135	.119	.161	.167

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/26/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1800	I	.000	.017	.070	.104	.048	.155	.160
	II	.210	.227	.164	.176	.194	.184	.151
	III	.000	.008	.069	.143	.055	.144	.170
	IV	.029	.113	.127	.125	.099	.153	.151
Plot mean		.060	.091	.108	.137	.099	.159	.158
2000	I	.019	.032	.089	.150	.073	.160	.145
	II	.197	.121	.153	.110	.145	.183	.161
	III	.120	.130	.132	.166	.137	.163	-----
	IV	.088	.110	.131	.154	.121	.151	.159
Plot mean		.106	.098	.126	.145	.119	.164	.155

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1 Date: 7/30/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	-----	.203	.032	.273	.169	.229	.219
	II	.380	.288	.296	.220	.296	.183	.193
	III	.182	.124	.184	.185	.169	.186	.194
	IV	.196	.210	.171	.219	.199	.163	.188
Plot mean		.253	.206	.171	.224	.208	.190	.199

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 2 Date: 8/6/79

DEPTH INTERVAL (CM)

Time	Quad	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
1200	I	.041	.115	.125	.136	.154	.155	.155	.171
	II	.058	.117	.137	.136	.143	.166	---	---
	III	.037	.110	.142	.145	.127	.138	.184	.195
	IV	.087	.156	.171	.174	.183	.235	---	---
Plot mean		.056	.125	.144	.148	.152	.174	.170	.183
1545	I	.014	.043	.058	.056	.134	.144	.124	.144
	II	.013	.010	.036	.073	.135	.157	---	---
	III	.010	.048	.127	.153	.156	.160	.175	.201
	IV	.022	.079	.107	.138	.153	.171	---	---
Plot mean		.015	.045	.082	.105	.145	.158	.150	.173

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 2

Date: 8/7/79

DEPTH INTERVAL (CM)

Time	Quad	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0945	I	.023	.067	.131	.131	.143	.146	.158	.157
	II	.022	.080	.112	.127	.139	.162	---	---
	III	.025	.080	.107	.136	.150	.149	.172	.194
	IV	.014	.062	.123	.150	.165	.191	---	---
Plot mean		.021	.072	.118	.136	.149	.162	.165	.176
1330	I	.007	.009	.042	.085	.128	.135	.142	.144
	II	.006	.008	.040	.083	.136	.159	---	---
	III	.003	.014	.091	.134	.151	.168	.169	.184
	IV	.005	.054	.125	.153	.171	.179	---	---
Plot mean		.005	.021	.075	.114	.147	.160	.156	.164
1630	I	.003	.006	.005	.034	.105	.137	.167	.184
	II	.003	.003	.015	.040	.116	.140	---	---
	III	.005	.008	.005	.118	.165	.174	.176	.201
	IV	.006	.017	.057	.096	.160	.173	---	---
Plot mean		.004	.009	.021	.072	.137	.156	.172	.193

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 2 Date: 8/8/79

DEPTH INTERVAL (CM)

Time	Quad	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0900	I	.011	.041	.075	.115	.149	.141	.139	.153
	II	.011	.018	.052	.105	.142	.148	---	---
	III	.014	.048	.099	.132	---	---	.180	.189
	IV	.010	.032	.093	.130	.157	.179	---	---
Plot mean		.012	.035	.080	.121	.149	.150	.160	.171
1400	I	.005	.005	.011	.036	.114	.150	.154	.162
	II	.005	.005	.012	.060	.116	.143	---	---
	III	.004	.006	.026	.079	.154	.165	.183	.204
	IV	.002	.003	.046	.094	.140	.159	---	---
Plot mean		.004	.005	.024	.068	.131	.154	.169	.183
1615	I	.004	.005	.036	.089	.121	.147	.149	.152
	II	.003	.012	.051	.114	.134	.164	---	---
	III	.003	.012	.068	.083	.151	.156	.165	.183
	IV	.005	.011	.045	.107	.139	.164	---	---
Plot mean		.004	.010	.050	.098	.136	.158	.157	.168

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 2 Date: 8/9/79

DEPTH INTERVAL (CM)

Time	Quad	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0915	I	.022	.034	.093	.116	.146	.153	---	.172
	II	.024	.104	.070	.105	.131	.163	---	---
	III	.014	.022	.043	.086	.133	.154	.170	.176
	IV	.019	.047	.061	.143	.144	.164	---	---
Plot mean		.020	.052	.067	.113	.139	.158	.170	.174
1600	I	.004	.007	.025	.071	.126	.140	.147	.162
	II	.004	.007	.034	.081	.142	.157	---	---
	III	.004	.009	.020	.034	.114	.168	.182	.193
	IV	.005	.009	.037	.110	.168	.183	---	---
Plot mean		.004	.008	.029	.074	.138	.162	.165	.178

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 2 Date: 8/10/79

DEPTH INTERVAL (CM)

Time	Quad	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0900	I	.019	.048	.099	.116	.138	.136	.156	.163
	II	.015	.018	.047	.082	.172	.162	---	---
	III	.015	.018	.035	.082	.132	.145	.156	.166
	IV	.017	.042	.058	.108	.154	.158	---	---
Plot mean		.017	.032	.060	.097	.149	.150	.156	.165
1545	I	.006	.008	.009	.012	.063	.146	.138	.173
	II	.004	.006	.009	.018	.075	.137	---	---
	III	.006	.013	.032	.072	.111	.154	.166	.201
	IV	.017	.034	.090	.129	.161	.185	---	---
Plot mean		.008	.015	.035	.058	.103	.156	.152	.187

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

PLOT NO. 3

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
8/21	1215	E	.158	.196	.179	.210	.206	.180	.198
		W	.161	.186	.156	.189	.185	.177	.188
		AVG	.160	.191	.168	.200	.196	.179	.193
	1615	E	.035	.170	.109	.184	.204	.201	.204
		W	.037	.155	.079	.192	.187	.184	.182
		AVG	.036	.163	.094	.188	.196	.193	.193
8/22	0945	E	.107	.172	.120	.201	.186	.188	.195
		W	.066	.177	.118	.234	.179	.176	.193
		AVG	.0865	.175	.119	.218	.183	.182	.194
	1400	E	.020	.116	.025	.181	.178	.182	.205
		W	.035	.164	.083	.189	.194	.228	.218
		AVG	.028	.140	.054	.185	.186	.205	.212
	1645	E	.050	.152	.069	.178	.195	.213	.208
		W	.020	.027	.021	.218	.147	.186	.189
		AVG	.035	.090	.045	.198	.171	.200	.199
8/23	0900	E	.264	.256	.259	.258	.249	.264	.239
		W	.239	.240	.246	.239	.236	.291	.224
		AVG	.252	.248	.253	.249	.243	.278	.232
	1645	E	.079	.169	.095	.184	.201	.216	.212
		W	.064	.132	.082	.163	.180	.202	.196
		AVG	.071	.150	.089	.173	.190	.209	.204
8/24	0900	E	.169	.184	.167	.195	.195	.199	.200
		W	.147	.175	.143	.182	.181	.203	.190
		AVG	.158	.180	.155	.188	.188	.201	.195
	1600	E	.023	.115	.038	.158	167	.179	.283
		W	.028	.133	.037	.160	.168	.186	.193
		AVG	.025	.124	.038	.159	.167	.183	.238

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

PLOT NO. 3

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
8/25	1430	E	.010	.064	.039	.140	.154	.175	.185
		W	.019	.115	.033	.179	.187	.184	.181
		AVG	.014	.090	.036	.159	.171	.180	.184
8/26	1430	E	.017	.105	.029	.148	.168	.189	.188
		W	.009	.100	.030	.144	.165	.179	.180
		AVG	.013	.103	.030	.146	.166	.184	.184
8/27	1030	E	.035	.067	.045	.151	.169	.184	.194
		W	.034	.123	.063	.160	.162	.177	.174
		AVG	.035	.095	.054	.156	.165	.181	.181
8/28	1430	E	.265	.241	.251	.239	.235	.241	.229
		W	.185	.181	.192	.191	.209	.215	.2121
		AVG	.225	.211	.216	.215	.222	.228	.220
8/29	1500	E	.074	.110	.091	.143	.173	.212	.195
		W	.067	.117	.092	.135	.167	.184	.183
		AVG	.070	.114	.092	.139	.170	.198	.189
8/30	1600	E	.059	.127	.064	.145	.175	.191	.205
		W	.051	.138	.064	.171	.174	.187	.185
		AVG	.055	.132	.064	.158	.174	.189	.195
9/4	1115	MIDDLE	.058	.135	.070	.167	.173	.183	.190

15-20	20-25	25-30
.206	.196	.178

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

PLOT NO. 4

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-3	3-5	5-9	9-15
9/6	1515	E	.127	.182	.142	.202	.187	.200	.205
		W	.172	.200	.199	.224	.225	.233	.229
		AVG	.149	.191	.171	.213	.206	.216	.217
9/7	0930	E	.124	.185	.132	.194	.194	.196	.195
		W	.166	.202	.173	.217	.226	.230	.230
		AVG	.145	.194	.153	.206	.210	.213	.213
	1445	E	.023	.084	.057	.184	.195	.208	.207
		W	.115	.206	.063	.217	.209	.219	.229
		AVG	.069	.145	.060	.200	.202	.213	.218
9/8	1430	E	.049	.116	.059	.195	.186	.205	.214
		W	.091	.164	.148	.198	.197	.206	.220
		AVG	.070	.139	.104	.196	.192	.206	.217
9/9	1415	E	.036	.056	.042	.178	.191	.213	.222
		W	.059	.170	.085	.208	.202	.225	.233
		AVG	.047	.113	.064	.193	.197	.219	.227
9/10	0630	E	.056	.119	.098	.174	.175	.188	.192
		W	.110	.174	.147	.188	.194	.213	.219
		AVG	.083	.146	.123	.181	.185	.201	.205
	0745	E	.034	.060	.041	.118	.169	.177	.189
		W	.031	.059	.091	.129	.176	.180	.198
		AVG	.032	.059	.066	.124	.173	.179	.193
	1000	E	.038	.127	.063	.163	.169	.178	.173
		W	.093	.176	.123	.191	.210	.208	.192
		AVG	.066	.151	.093	.177	.189	.193	.182
	1200	E	.050	.136	.085	.181	.186	.191	.206
		W	.097	.184	.122	.203	.202	.214	.213
		AVG	.074	.160	.103	.192	.194	.203	.209
	1400	E	.022	.133	.076	.169	.188	.194	.205
		W	.071	.168	.141	.187	.184	.196	.198
		AVG	.047	.150	.108	.178	.186	.195	.202

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

PLOT NO. 4

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/10	1600	E	.008	.055	.013	.167	.180	.202	.199
		W	.028	.139	.064	.168	.188	.201	.215
		AVG	.018	.097	.039	.168	.184	.202	.207
	1800	E	.264	.156	.060	.186	.187	.200	.195
		W	.075	.145	.075	.170	.173	.197	.219
		AVG	.169	.150	.068	.178	.180	.198	.207
	2000	E	.044	.107	.067	.157	.180	.177	.222
		W	.054	.119	.062	.168	.194	.208	.201
		AVG	.049	.113	.065	.162	.187	.193	.211
	2245	E	.033	.077	.049	.162	.182	.212	.198
		W	.084	.114	.125	.184	.196	.188	.209
		AVG	.059	.096	.087	.173	.189	.200	.204
9/11	0715	E	.047	.093	.049	.143	.170	.204	.190
		W	.072	.132	.076	.192	.189	.213	.230
		AVG	.060	.112	.063	.168	.180	.209	.210
	1500	E	.018	.072	.022	.163	.179	.201	.200
		W	.066	.150	.102	.194	.204	.211	.180
		AVG	.042	.111	.062	.178	.191	.206	.190
9/12	1500	E	.031	.029	.027	.052	.121	.164	.160
		W	.029	.056	.030	.182	.191	.225	.222
		AVG	.030	.043	.028	.117	.156	.195	.191
9/13	1445	E	.022	.059	.025	.148	.156	.195	.186
		W	.028	.143	.046	.208	.205	.227	.232
		AVG	.025	.101	.036	.178	.180	.211	.209
9/14	1400	E	.008	.017	.012	.121	.177	.183	.185
		W	.013	.039	.014	.137	.167	.201	.210
		AVG	.011	.028	.013	.129	.172	.192	.197
9/17	1500	E	.015	.039	.026	.146	.170	.179	.192
		W	.018	.051	.027	.136	.168	.197	.205
		AVG	.016	.045	.026	.141	.169	.188	.198
9/19	1500	E	.011	.019	.019	.060	.165	.184	.189
		W	.032	.140	.079	.183	.190	.203	.206
		AVG	.022	.079	.049	.122	.178	.193	.198

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

PLOT NO. 5

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/21	1430	E	.243	.231	.228	.234	.209	.220	.210
		W	.209	.221	.223	.213	.208	.223	.217
		AVG	.226	.226	.225	.224	.209	.221	.213
9/25	1530	E	.038	.114	.053	.185	.188	.208	.217
		W	.049	.141	.047	.192	.197	.220	.244
		AVG	.044	.128	.050	.188	.192	.214	.230
9/28	1530	E	.021	.027	.023	.093	.150	.181	.181
		W	.025	.055	.029	.121	.156	.179	.190
		AVG	.023	.041	.026	.107	.153	.180	.185
10/2	1530	E	.019	.072	.018	.133	.168	.178	.188
		W	.026	.083	.039	.134	.150	.170	.194
		AVG	.022	.077	.028	.134	.159	.174	.191
10/5	1430	E	.017	.024	.025	.079	.164	.184	.177
		W	.017	.052	.019	.113	.146	.180	.173
		AVG	.017	.038	.022	.096	.155	.182	.175
10/9	1600	E	.030	.041	.034	.080	.123	.188	.181
		W	.044	.083	.046	.137	.156	.193	.196
		AVG	.037	.062	.040	.108	.140	.191	.186
10/12	1630	E	.019	.070	.034	.151	.148	.173	.189
		W	.024	.044	.030	.138	.162	.188	.168
		AVG	.021	.057	.040	.144	.155	.180	.179
10/16	1500	E	.147	.140	.155	.173	.167	.174	.188
		W	.134	.135	.127	.154	.163	.189	.188
		AVG	.141	.138	.141	.163	.165	.181	.188
10/19	1500	MIDDLE	.042	.089	.055	.159	.159	.175	.187

APPENDIX E

BULK DENSITY DATA

SOIL MOISTURE MEASUREMENTS
BULK DENSITY (GM/CM^3)

PLOT NO. 1

DEPTH INTERVAL (CM)	BULK DENSITY (GM/CM^3)
0-5	1.500
5-10	1.660
10-15	1.485

SOIL MOISTURE MEASUREMENTS

BULK DENSITY (GM/CM^3)

PLOT NO. 2

DEPTH INTERVAL (CM)	BULK DENSITY (GM/CM^3)
0-½	1.486
½-1	1.197
0-1	1.249
1-2	1.134
2-5	1.002
5-9	1.057
9-15	1.038
15-20	1.007
20-25	1.152
25-30	1.650

SOIL MOISTURE MEASUREMENTS

BULK DENSITY (GM/CM^3)

PLOT NO. 3

DATE INTERVAL: 8/21 through 8/22

DEPTH INTERVAL (CM)	BULK DENSITY (GM/CM^3)
0-½	1.486
½-1	1.197
0-1	1.249
1-2	1.134
2-5	1.002
5-9	1.057
9-15	1.038
15-20	1.007
20-25	1.152
25-30	1.650

DATE INTERVAL: 8/23 through 8/27

0-½	1.578
½-1	1.472
0-1	1.457
1-2	1.111
2-5	1.083
5-9	1.057
9-15	1.038
15-20	1.007
20-25	1.152
25-30	1.650

SOIL MOISTURE MEASUREMENTS

BULK DENSITY (GM/CM^3)

PLOT NO. 3

DATE INTERVAL: 8/28 through 9/4

DEPTH INTERVAL (CM)	BULK DENSITY (GM/CM^3)
0-½	1.546
½-1	1.512
0-1	1.525
1-2	1.181
2-5	0.969
5-9	1.057
9-15	1.038
15-20	1.007
20-25	1.152
25-30	1.650

SOIL MOISTURE MEASUREMENTS

BULK DENSITY (GM/CM^3)

PLOT NO. 4

DATE INTERVAL: 9/6 through 9/14

DEPTH INTERVAL (CM)	BULK DENSITY (GM/CM^3)
0-½	1.565
½-1	1.451
0-1	1.493
1-2	1.254
2-5	1.153
5-9	1.153
9-15	1.187

SOIL MOISTURE MEASUREMENTS

BULK DENSITY (GM/CM^3)

PLOT NO. 5

DEPTH INTERVAL (CM)	BULK DENSITY (GM/CM^3)
0-½	1.507
½-1	1.457
0-1	1.490
1-2	1.240
2-5	1.136
5-9	1.308
9-15	1.533

APPENDIX F

VOLUMETRIC MOISTURE DATA

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/9/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1000	I	.546	.438	.405	.392	.438	.420	.443
	II	.579	.401	.398	.393	.443	.363	.423
	III	.408	.339	.320	.335	.351	.368	.365
	IV	.467	.359	.354	.332	.378	.336	.347
PLOT MEAN		.500	.384	.369	.363	.402	.372	.395
1200	I	---	.300	.246	.251	.266	.273	.356
	II	.416	.350	.431	.290	.372	338	.368
	III	.375	.375	.350	.321	.356	.279	.285
	IV	.462	.321	.263	.282	.336	.315	.330
PLOT MEAN		.417	.336	.323	.287	.332	.302	.335
1600	I	.513	.386	.363	.309	.393	.354	.374
	II	.458	.473	.371	.350	.413	.327	.312
	III	.390	.324	.285	.276	.320	.273	.278
	IV	.452	.302	.306	.291	.338	.306	.359
PLOT MEAN		.431	.371	.332	.306	.366	.315	.330

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/10/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.660	.407	.369	.360	.449	.363	.380
	II	.440	.405	.317	.375	.384	.363	.312
	III	.372	.344	.276	.228	.305	.278	.315
	IV	.420	.329	.318	.300	.341	.320	.306
PLOT MEAN		.473	.371	.320	.315	.369	.332	.329
1300	I	.474	.402	.386	.423	.422	.312	.321
	II	.324	.276	.227	.180	.252	.296	.285
	III	.464	.410	.252	.282	.353	.257	.323
	IV	.347	.293	.266	.272	.294	.323	.300
PLOT MEAN		.402	.345	.282	.290	.330	.297	.308
1600	I	.594	.461	---	.270	.444	.311	.330
	II	.318	.410	.470	.407	.401	.326	.302
	III	.474	.375	.389	.336	.393	.312	.324
	IV	.357	.309	.281	.303	.312	.294	.296
PLOT MEAN		.437	.389	.380	.329	.387	.311	.314

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/11/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.426	.432	---	.315	.390	.282	.333
	II	.347	.366	.314	.368	.348	.354	.311
	III	.392	.369	.339	.242	.336	.308	.326
	IV	.479	.300	.318	.284	.345	.299	.299
PLOT MEAN		.411	.293	.324	.302	.356	.311	.317
1300	I	.519	.530	.299	.227	.393	.317	.318
	II	.332	.312	.299	.497	.359	.350	.311
	III	.258	.218	.285	.254	.254	.254	.266
	IV	.239	.261	.269	.216	.246	.240	.264
PLOT MEAN		.338	.330	.288	.299	.314	.314	.314
1600	I	.402	.269	.194	.345	.303	.309	.335
	II	.395	.345	.255	---	.332	.284	.278
	III	.275	.266	.194	.195	.233	.198	.272
	IV	---	.171	.230	.206	.203	.257	.266
PLOT MEAN		.357	.263	.218	.249	.267	.263	.288

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/12/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.408	.443	---	.212	.354	.248	.336
	II	.378	.356	.317	.305	.339	.335	.335
	III	.278	.329	.269	.314	.297	.285	.311
	IV	.387	.287	.305	.242	.305	.275	.270
PLOT MEAN		.363	.354	.297	.269	.324	.285	.314
1300	I	.234	.147	.221	.266	.218	.248	.260
	II	.189	.252	.201	.176	.204	.234	.243
	III	.146	.299	.116	.156	.179	.260	.281
	IV	.135	.215	.207	.203	.191	.249	.288
PLOT MEAN		.176	.228	.186	.200	.198	.248	.269
1600	I	.314	.227	.131	.225	.224	.482	.305
	II	.264	.392	.161	.249	.264	.414	.267
	III	.059	.212	.368	.395	.260	.305	.291
	IV	.228	.134	.144	.146	.164	.207	.234
PLOT MEAN		.216	.242	.201	.254	.228	.351	.275

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/13/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.314	.245	.129	---	.230	.308	.321
	II	.408	.561	.392	.324	.422	.035	---
	III	.237	.386	.362	.345	.333	.315	.276
	IV	.342	.305	.293	.308	.312	.293	.257
PLOT MEAN		.326	.255	.201	.206	.257	.254	.254
1300								
	I	.362	.255	.201	.206	.257	.254	.254
	II	.384	.405	.441	---	.410	.306	.293
	III	.140	.197	---	.185	.174	.225	.252
	IV	.155	.141	.177	.201	.168	.230	.263
PLOT MEAN		.260	.249	.273	.197	.252	.254	.266
1600	I	.320	.122	.225	.164	.207	.255	.282
	II	.306	.270	.210	.242	.257	.284	.279
	III	.119	.123	.131	.180	.138	.210	.236
	IV	.062	.149	.179	.258	.162	.144	.263
PLOT MEAN		.201	.167	.186	.212	.191	.224	.266

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (cm^3/cm^3)

PLOT NO. 1 DATE: 7/14/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.426	.095	.156	.266	.237	.303	.282
	II	.210	.135	.186	.198	.180	.224	.285
	III	.087	.092	.101	.234	.131	.234	.243
	IV	.147	.111	.131	.185	.143	.185	.251
PLOT MEAN		.218	.108	.144	.221	.173	.237	.267

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/16/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.476	.230	.264	.239	.302	.248	.291
	II	.309	.344	.284	.177	.279	.347	.287
	III	.212	.194	.209	.189	.201	.228	.243
	IV	.195	.212	.182	.212	.198	.204	.240
PLOT MEAN		.299	.245	.234	.204	.245	.257	.266

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/17/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0830	I	.419	.425	.296	.336	.369	.333	.327
	II	.437	.362	.341	.324	.366	.342	.282
	III	.429	.303	.285	.254	.318	.267	.288
	IV	.510	.407	.435	.377	.432	.356	.404
PLOT MEAN		.449	.374	.339	.323	.371	.324	.326

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/18/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.413	.269	----	.255	.312	.288	.308
	II	.350	.309	.264	.243	.291	.275	.276
	III	.311	.323	.353	.251	.309	.272	.303
	IV	.375	.305	.318	.261	.315	.353	.314
PLOT MEAN		.362	.302	.312	.252	.308	.297	.300
1340	I	.318	.221	.219	.198	.239	.312	.311
	II	.305	.299	.228	.264	.275	.293	.270
	III	.275	.252	.268	.300	.279	.291	.279
	IV	.422	.294	.317	.278	.327	.287	.272
PLOT MEAN		.330	.267	.263	.260	.279	.296	.284
1600	I	.294	.254	.311	.245	.276	.306	.326
	II	.224	.224	.227	.222	.224	.272	.303
	III	.323	.245	.215	.183	.242	.188	.290
	IV	.291	.122	.179	.158	.188	.255	.260
PLOT MEAN		.284	.212	.233	.203	.233	.255	.294

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/19/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.320	.255	.240	.239	.264	.315	.317
	II	.522	.383	.428	.287	.405	.299	.333
	III	---	---	.303	.282	.293	.276	.275
	IV	.317	.272	.222	.203	.255	.264	.291
PLOT MEAN		.386	.303	.299	.312	.303	.288	.305
1350	I	.303	.186	.213	.254	.239	.284	.266
	II	.288	.300	.308	.258	.288	.264	.312
	III	.209	.206	.243	.231	.222	.276	.258
	IV	.456	.299	.299	.270	.332	.329	.326
PLOT MEAN		.314	.248	.266	.254	.270	.288	.291
1600	I	.243	.179	.248	.321	.248	.377	.269
	II	.294	.255	.288	.351	.297	.429	.284
	III	.225	.222	.126	.183	.189	.230	.267
	IV	.308	.225	.174	.234	.236	.237	.248
PLOT MEAN		.267	.221	.209	.273	.242	.318	.267

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/20/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2 4
1300	I	.398	.227	.192	.230	.261	.267	.293
	II	.413	.264	.290	.258	.306	.261	.305
	III	.159	.219	.165	.171	.179	.213	.257
	IV	.198	.116	.144	.161	.155	.221	.261
PLOT MEAN		.290	.207	.198	.206	.225	.240	.279

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/23/79

TIME	QUAD	DEPTH INTERVAL (CM) 0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0800	I	.128	.159	.240	.110	.239	.176	.258
	II	.320	.237	.260	.225	.261	.267	.270
	III	.167	.218	.182	.216	.195	.221	.227
	IV	.122	.098	.149	.183	.138	.212	.245
PLOT MEAN		.185	.179	.207	.183	.209	.219	.251
1300	I	.038	.102	.135	.125	.101	.222	.240
	II	.312	.270	.230	.257	.267	.281	.264
	III	.113	.227	.216	.153	.177	.233	.258
	IV	.050	.071	.185	.167	.119	.222	.210
PLOT MEAN		.128	.168	.192	.176	.165	.240	.243
1600	I	.024	.038	.182	.195	.110	.243	.270
	II	.035	.090	.312	.114	.138	.194	.260
	III	.036	.122	.149	.123	.108	.189	.237
	IV	.050	.326	.333	.179	.222	.194	.230
PLOT MEAN		.036	.143	.245	.153	.144	.206	.249

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/24/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	.059	.161	.104	.141	.116	.179	.204
	II	.345	.252	.339	.206	.285	.284	.279
	III	.140	.158	.210	.215	.180	.246	.251
	IV	.177	.188	.180	.186	.183	.240	.254
PLOT MEAN		.180	.189	.209	.188	.191	.237	.248
1330	I	---	.095	.135	.110	.110	.188	.206
	II	.395	.128	.138	.164	.206	.242	.263
	III	.066	.078	.212	.096	.113	.119	.213
	IV	.027	.164	.110	.128	.107	.200	.213
PLOT MEAN		.162	.116	.149	.125	.135	.188	.224
1600	I	.000	.012	.050	.084	.036	.144	.206
	II	.240	.234	.270	.222	.242	.255	.272
	III	---	.155	.110	.183	.149	.221	.237
	IV	.053	.087	.078	.137	.089	.165	.191
PLOT MEAN		.098	.122	.128	.156	.129	.197	.227

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/25/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0830	I	.003	.116	.186	.129	.108	.230	.236
	II	.282	---	---	.225	.254	.252	.276
	III	.300	.182	.198	.308	.246	.246	.258
	IV	.078	.183	.138	.258	.167	.228	.275
PLOT MEAN		.165	.161	.174	.230	.194	.239	.261
1600	I	.038	.114	.116	.176	.111	.221	.228
	II	.260	.231	.242	.239	.243	.243	.249
	III	.054	.164	.194	.195	.152	.170	.234
	IV	.039	.104	.198	.197	.135	.218	.237
PLOT MEAN		.098	.153	.188	.201	.161	.213	.237

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1

DATE: 7/26/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0600	I	.272	.141	.230	.212	.213	.234	---
	II	.204	.194	.257	.336	.248	.353	.240
	III	.134	.225	.146	.194	.174	.233	.243
	IV	.117	.153	.216	---	.162	.194	.221
PLOT MEAN		.182	.179	.212	.248	.200	.254	.234
0800	I	.156	.069	.108	.120	.114	.200	.195
	II	.257	.218	.267	.258	.251	.218	.233
	III	.315	.335	.177	.128	.239	.251	.248
	IV	.084	.213	.219	.230	.186	.231	.221
PLOT MEAN		.203	.209	.194	.185	.197	.225	.224
1000	I	.065	.141	.113	.129	.113	.246	---
	II	.240	.269	.230	.252	.248	.159	.224
	III	.113	.243	.242	.174	.194	.222	.240
	IV	.035	.086	.177	.201	.125	.228	.240
PLOT MEAN		.113	.185	.191	.189	.170	.215	.234

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/26/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1200	I	.147	.164	.312	.111	.183	.209	.254
	II	.297	.206	.275	.257	.258	---	---
	III	.081	.212	.182	.189	.167	.251	.347
	IV	.180	.149	.176	.161	.167	.203	.218
PLOT MEAN		.177	.183	.236	.180	.194	.221	.273
1400	I	.105	.170	.159	.261	.174	.240	.245
	II	.344	.383	.279	.296	.326	.333	.234
	III	.156	.261	.333	.282	.238	.291	.248
	IV	.170	.231	.221	.224	.212	.252	.236
PLOT MEAN		.194	.261	.248	.266	.242	.279	.240
1600	I	.192	---	.269	---	.231	.245	.218
	II	.168	.200	.201	.221	.198	.294	.332
	III	.023	.059	.126	.221	.107	.213	.236
	IV	.264	.128	.158	.165	.178	.215	.215
PLOT MEAN		.162	.129	.189	.203	.179	.242	.251

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/26/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2.4
1800	I	.000	.026	.105	.156	.072	.233	.240
	II	.315	.341	.246	.264	.291	.276	.227
	III	.000	.012	.104	.215	.083	.216	.255
	IV	.044	.170	.191	.188	.149	.230	.227
PLOT MEAN		.090	.137	.162	.206	.149	.239	.237
2000	I	.029	.048	.134	.225	.110	.240	.218
	II	.296	.182	.230	.165	.218	.275	.242
	III	.180	.195	.198	.249	.206	.245	---
	IV	.132	.165	.197	.231	.182	.227	.239
PLOT MEAN		.159	.147	.189	.218	.179	.246	.233

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT Θ_v (CM^3/CM^3)

PLOT NO. 1 DATE: 7/30/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0900	I	---	.305	.048	.410	.254	.344	.329
	II	.570	.432	.444	.330	.444	.275	.290
	III	.273	.186	.276	.278	.254	.279	.291
	IV	.294	.315	.257	.329	.299	.245	.282
PLOT MEAN		.380	.309	.257	.336	.312	.285	.299

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 2 DATE: 8/6/79

		DEPTH INTERVAL (CM)							
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
1200	I	.061	.171	.150	.163	.175	.155	.164	.177
	II	.086	.174	.164	.163	.162	.166	---	---
	III	.055	.163	.170	.174	.144	.138	.194	.202
	IV	.129	.232	.205	.208	.208	.235	---	---
PLOT MEAN		.083	.186	.172	.177	.172	.174	.180	.190
1545	I	.021	.064	.069	.067	.152	.144	.131	.149
	II	.019	.015	.043	.087	.153	.157	---	---
	III	.015	.071	.152	.183	.177	.160	.185	.209
	IV	.033	.117	.128	.165	.174	.171	---	---
PLOT MEAN		.022	.067	.098	.126	.164	.158	.159	.180

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 2 DATE: 8/7/79

		DEPTH INTERVAL (CM)							
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0945	I	.034	.100	.157	.157	.162	.146	.167	.163
	II	.033	.119	.134	.152	.158	.162	---	---
	III	.037	.119	.128	.163	.170	.149	.182	.201
	IV	.059	.092	.147	.180	.187	.191	---	---
PLOT MEAN		.031	.107	.141	.163	.169	.162	.174	.183
1330	I	.010	.013	.050	.102	.145	.135	.150	.149
	II	.009	.012	.048	.099	.154	.159	---	---
	III	.004	.021	.109	.160	.171	.168	.179	.191
	IV	.007	.080	.150	.183	.194	.179	---	---
PLOT MEAN		.007	.031	.090	.136	.167	.160	.165	.170
1630	I	.004	.009	.006	.041	.119	.137	.177	.191
	II	.004	.004	.018	.048	.132	.140	---	---
	III	.007	.012	.006	.141	.187	.174	.186	.209
	IV	.009	.025	.068	.115	.181	.173	---	---
PLOT MEAN		.006	.013	.025	.086	.155	.156	.182	.200

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3CM^3)

PLOT NO. 2 DATE: 8/8/79

		DEPTH INTERVAL (CM)							
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0900	I	.016	.061	.090	.138	.169	.141	.147	.159
	II	.016	.027	.062	.126	.161	.158	---	---
	III	.021	.071	.119	.158	---	---	.190	.196
	IV	.015	.048	.111	.156	.178	.179	---	---
PLOT MEAN		.018	.052	.096	.145	.169	.150	.169	.177
1400	I	.007	.007	.013	.043	.129	.150	.163	.168
	II	.007	.007	.014	.072	.132	.143	---	---
	III	.006	.009	.031	.095	.175	.165	.193	.212
	IV	.003	.004	.055	.113	.159	.159	---	---
PLOT MEAN		.006	.007	.029	.081	.149	.154	.179	.190
1615	I	.006	.007	.043	.107	.137	.147	.157	.158
	II	.004	.018	.061	.136	.152	.164	---	---
	III	.004	.018	.081	.099	.171	.156	.174	.190
	IV	.007	.016	.054	.128	.158	.164	---	---
PLOT MEAN		.006	.015	.060	.117	.154	.158	.166	.174

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 2 DATE: 8/9/79

TIME	QUAD	DEPTH INTERVAL (CM) 0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0915	I	.033	.051	.111	.139	.166	.153	---	.179
	II	.036	.155	.084	.126	.149	.162	---	---
	III	.021	.033	.051	.103	.151	.154	.180	.183
	IV	.028	.070	.073	.171	.163	.164	---	---
PLOT MEAN		.030	.077	.080	.135	.158	.158	.180	.181
1600	I	.006	.010	.030	.085	.14?	.140	.155	.168
	II	.006	.010	.041	.097	.161	.157	---	---
	III	.006	.013	.024	.041	.129	.168	.192	.200
	IV	.007	.013	.044	.132	.191	.183	---	---
PLOT MEAN		.006	.012	.035	.089	.156	.162	.174	.185

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 2 DATE: 8/10/79

TIME	QUAD	DEPTH INTERVAL (CM) 0-.25	.25-.5	.5-.75	.75-1	1-2	2-5	5-9	9-15
0900	I	.028	.071	.119	.139	.156	.136	.165	.169
	II	.022	.027	.056	.098	.195	.162	---	---
	III	.022	.027	.042	.098	.150	.145	.165	.172
	IV	.025	.062	.069	.129	.175	.158	---	---
PLOT MEAN		.025	.048	.072	.116	.169	.150	.165	.171
1545	I	.009	.012	.011	.014	.071	.146	.146	.180
	II	.006	.009	.011	.022	.085	.137	---	---
	III	.009	.019	.038	.086	.126	.154	.175	.209
	IV	.025	.051	.108	.154	.183	.185	---	---
PLOT MEAN		.012	.022	.042	.069	.117	.156	.161	.194

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 3

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
8/21	1215	E	.235	.235	.224	.238	.206	.190	.206
		W	.239	.223	.195	.214	.185	.187	.201
		AVG	.237	.229	.210	.226	.196	.189	.201
	1615	E	.052	.204	.136	.209	.204	.213	.212
		W	.055	.186	.099	.218	.187	.195	.189
		AVG	.054	.195	.118	.214	.196	.204	.201
8/22	0945	E	.159	.206	.150	.228	.186	.199	.202
		W	.098	.212	.147	.265	.179	.186	.200
		AVG	.129	.209	.149	.247	.183	.193	.201
	1400	E	.030	.139	.031	.205	.178	.192	.213
		W	.052	.196	.104	.214	.194	.241	.226
		AVG	.041	.168	.068	.210	.186	.217	.220
	1645	E	.074	.182	.086	.202	.195	.225	.216
		W	.030	.032	.026	.247	.147	.197	.196
		AVG	.052	.107	.056	.225	.171	.211	.206
8/23	0900	E	.417	.377	.377	.289	.270	.279	.248
		W	.377	.353	.358	.266	.256	.308	.233
		AVG	.397	.365	.368	.278	.263	.294	.241
	1645	E	.125	.249	.139	.205	.218	.228	.220
		W	.100	.194	.119	.181	.195	.213	.203
		AVG	.113	.222	.129	.193	.207	.221	.212
8/24	0900	E	.267	.271	.243	.217	.211	.210	.208
		W	.232	.258	.208	.203	.196	.215	.197
		AVG	.250	.264	.226	.210	.204	.213	.203
	1600	E	.036	.169	.055	.175	.181	.189	.293
		W	.044	.195	.054	.177	.182	.197	.200
		AVG	.040	.182	.055	.176	.181	.193	.247

SOIL MOSITURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 3

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
8/25	1430	E	.016	.095	.057	.155	.167	.185	.192
		W	.030	.170	.048	.196	.203	.194	.188
		AVG	.023	.132	.052	.177	.185	.190	.190
8/26	1430	E	.026	.155	.043	.164	.182	.200	.195
		W	.014	.147	.043	.160	.178	.189	.187
		AVG	.020	.151	.043	.162	.180	.194	.191
8/27	1030	E	.055	.099	.066	.168	.183	.195	.201
		W	.054	.182	.092	.178	.175	.187	.181
		AVG	.055	.140	.079	.173	.179	.191	.191
8/28	1430	E	.409	.364	.383	.282	.227	.255	.237
		W	.286	.273	.293	.226	.202	.227	.220
		AVG	.348	.318	.338	.254	.215	.241	.229
8/29	1500	E	.115	.167	.139	.169	.168	.224	.203
		W	.103	.177	.141	.159	.162	.194	.190
		AVG	.109	.172	.140	.164	.165	.209	.196
8/30	1600	E	.092	.193	.098	.171	.169	.202	.212
		W	.079	.208	.097	.202	.168	.198	.192
		AVG	.085	.200	.097	.187	.169	.200	.202
9/4	1115	MIDDLE	.089	.205	.106	.197	.168	.194	.197

15-20	20-25	25-30
.207	.226	.292

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 4

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/6	1515	E	.198	.265	.213	.253	.216	.230	.244
		W	.269	.290	.297	.281	.260	.268	.272
		AVG	.234	.277	.255	.267	.238	.249	.258
9/7	0930	E	.194	.269	.198	.243	.223	.226	.231
		W	.259	.293	.258	.273	.261	.265	.274
		AVG	.226	.281	.228	.258	.242	.246	.252
	1445	E	.036	.122	.084	.231	.224	.240	.246
		W	.179	.299	.093	.272	.241	.252	.272
		AVG	.108	.211	.089	.251	.232	.246	.259
9/8	1430	E	.076	.168	.088	.244	.215	.236	.254
		W	.092	.246	.127	.261	.233	.259	.276
		AVG	.074	.164	.095	.242	.227	.252	.270
9/10	0630	E	.088	.172	.146	.218	.202	.217	.228
		W	.171	.252	.220	.236	.223	.246	.260
		AVG	.130	.212	.183	.227	.213	.231	.244
	0745	E	.053	.087	.061	.148	.195	.204	.224
		W	.048	.086	.136	.162	.203	.208	.234
		AVG	.050	.086	.098	.155	.199	.206	.229
	1000	E	.060	.184	.094	.205	.195	.205	.205
		W	.146	.255	.183	.239	.242	.240	.227
		AVG	.103	.219	.139	.222	.218	.222	.216
	1200	E	.078	.198	.127	.226	.214	.220	.245
		W	.152	.267	.182	.254	.233	.247	.253
		AVG	.115	.233	.154	.240	.224	.234	.249
	1400	E	.035	.193	.114	.212	.217	.223	.244
		W	.111	.244	.210	.235	.212	.225	.235
		AVG	.073	.218	.162	.224	.215	.224	.240

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 4

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/10	1600	E	.012	.080	.020	.210	.208	.233	.236
		W	.043	.202	.096	.211	.217	.232	.255
		AVG	.028	.141	.058	.210	.212	.232	.245
	1800	E	.412	.226	.090	.234	.216	.230	.232
		W	.117	.210	.112	.213	.200	.227	.260
		AVG	.265	.218	.101	.223	.208	.229	.246
	2000	E	.068	.155	.100	.197	.208	.204	.263
		W	.084	.173	.093	.210	.224	.240	.239
		AVG	.076	.164	.096	.204	.216	.222	.251
	2245	E	.052	.112	.073	.203	.210	.244	.235
		W	.131	.165	.187	.231	.226	.217	.248
		AVG	.092	.139	.130	.217	.218	.231	.242
9/11	0715	E	.074	.135	.073	.180	.196	.235	.225
		W	.113	.191	.114	.241	.218	.245	.274
		AVG	.093	.163	.093	.210	.207	.240	.249
	1500	E	.0277	.105	.034	.204	.207	.231	.237
		W	.103	.218	.152	.243	.235	.244	.212
		AVG	.065	.162	.093	.224	.221	.237	.225
9/12	1500	E	.049	.042	.040	.065	.140	.190	.190
		W	.034	.082	.044	.228	.220	.260	.263
		AVG	.0417	.062	.042	.146	.180	.224	.227
9/13	1445	E	.035	.085	.038	.186	.180	.225	.221
		W	.045	.207	.069	.261	.236	.261	.275
		AVG	.040	.146	.053	.223	208	.243	.248
9/14	1400	E	.013	.025	.018	.152	.204	.212	.219
		W	.021	.056	.021	.171	.192	.232	.249
		AVG	.017	.041	.020	.162	.198	.222	.234
9/17	1500	E	.023	.057	.038	.183	.196	.207	.227
		W	.028	.080	.041	.171	.194	.227	.244
		AVG	.025	.068	.039	.176	.195	.217	.235
9/19	1500	E	.017	.029	.028	.076	.190	.212	.224
		W	.050	.218	.117	.229	.220	.234	.245
		AVG	.034	.124	.073	.152	.205	.223	.235

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 5

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/21	1430	E	.366	.336	.339	.291	.238	.288	.321
		W	.314	.322	.332	.264	.237	.291	.332
		AVG	.340	.329	.336	.277	.237	.290	.327
9-25	1530	E	.057	.166	.079	.229	.213	.272	.332
		W	.074	.206	.070	.238	.224	.288	.373
		AVG	.066	.186	.075	.233	.219	.280	.353
9-28	1530	E	.031	.040	.035	.116	.171	.237	.277
		W	.037	.080	.043	.150	.178	.235	.291
		AVG	.034	.060	.039	.133	.174	.237	.284
10/2	1530	E	.028	.105	.026	.165	.191	.233	.289
		W	.039	.120	.058	.166	.171	.223	.297
		AVG	.033	.113	.042	.166	.181	.228	.293
10/5	1430	E	.025	.035	.038	.098	.186	.241	.271
		W	.026	.076	.028	.140	.165	.235	.266
		AVG	.025	.056	.033	.119	.176	.238	.269
10/9	1600	E	.045	.059	.051	.099	.140	.246	.277
		W	.066	.121	.069	.170	.177	.252	.301
		AVG	.056	.090	.060	.134	.159	.249	.245
10/12	1630	E	.028	.102	.050	.187	.169	.226	.290
		W	.036	.064	.044	.171	.185	.246	.258
		AVG	.032	.083	.047	.179	.177	.236	.274
10/16	1500	E	.221	.204	.231	.215	.190	.227	.289
		W	.202	.197	.189	.190	.185	.247	.289
		AVG	.212	.200	.210	.203	.187	.237	.289
10/19	1500	MIDDLE	.064	.130	.083	.197	.181	.229	.286

APPENDIX G

TEMPERATURE MEASUREMENT RECORD

PLOT # 1 TEMPERATURE MEASUREMENT TIMES

DATE	TIME	COMMENTS	DATE	TIME	COMMENTS
709	859		713	809	
709	1344	Relative	713	839	
709	1601	Humidity	713	909	
710	830	Sensors at 5cm	713	939	
710	1329	and 100cm	713	1009	
710	1503	Worked	713	1039	
711	800	Throughout	713	1109	
711	1249	Plot 1	713	1139	
711	1653		713	1209	
712	659	Inconsis-	712	1239	
712	719	tent	713	1309	
712	739	Measurement	713	1339	
712	809	Time At	713	1409	
712	829	Start Of	713	1429	
712	859	Plot Due	713	1459	
712	929	To Problems	713	1529	
712	959	With The	713	1559	
712	1029	DL-520	713	1629	
712	1059		713	1659	
712	1129		713	1729	
712	1159		713	1759	
712	1229		713	1829	
712	1259		713	1859	
712	1329		713	1929	
712	1359		713	1959	
712	1429		713	2029	Data Logger Reset To
712	1459		714	39	Make Measurements In
712	1529		714	239	Two Hour Intervals
712	1559		714	439	
712	1659		714	639	
712	1729		714	839	
712	1759		714	1339	
712	1829		714	1628	
712	1859		714	1839	
712	1929		714	1939	
712	1959		714	2139	
712	2007		714	2339	
712	2107		715	139	
712	2207		715	339	
712	2307		715	539	
713	7		715	739	
713	107		715	839	
713	207		715	1039	
713	307		715	1239	
713	407		715	1439	
713	507		715	1617	
713	607		715	1839	
713	702		715	2039	
713	719		715	2239	
713	739		716	39	

PLOT # 1 (con't) TEMPERATURE MEASUREMENT TIMES

DATE	TIME	COMMENTS
716	239	
716	439	
716	639	
716	739	
716	939	
716	1131	
716	1139	
716	1239	
716	1439	
716	1639	
716	1839	
716	2039	
716	2239	
717	39	
717	239	
717	439	
717	639	
717	839	
717	1030	
717	1139	Data Logger
717	1339	Inconsistent
717	1539	In Two
717	1739	Hour
717	1939	Interval
717	2029	
717	2239	
718	39	
718	239	
718	439	
718	639	
718	839	
718	1039	
718	1239	
718	1439	
718	1639	
718	1839	
718	2039	
718	2239	
719	39	
719	239	
719	439	
719	639	
719	739	
719	939	
719	1139	
719	1339	
719	1439	
719	1639	
719	2039	Data Logger
720	39	Reset To
		Make
720	439	Measurements
720	836	In Four Hour
720	1239	Intervals
720	1939	Data Logger
720	2339	Inconsistent
721	339	In Four
721	739	Hour Interval
721	1139	
721	1539	
721	1939	
721	2339	
722	239	
722	639	
722	1039	
722	1439	
723	239	
723	639	
723	1039	
723	1439	
723	1839	
723	2239	
724	139	
724	539	
724	939	
724	1339	
724	1739	
724	2139	
725	139	
725	539	
725	839	
725	1239	
725	1639	
725	2039	
726	39	
726	439	
726	601	Start Of
726	802	Diurnal
726	1039	
726	1234	
726	1400	
726	1632	
726	1816	
726	1957	

Plot # 2 TEMPERATURE MEASUREMENT TIMES

DATE	TIME	COMMENTS	DATE	TIME	COMMENTS
806	1139		808	1339	
806	1239	Relative	808	1439	
806	1339	Humidity	808	1539	
806	1439	Sensor	808	1639	
806	1539	At 5 cm	808	1739	
806	1639	Quit Work-	808	1839	
806	1739	ing Properly	808	1939	
806	1839	Between	808	2039	
806	1939	Plots 1	808	2139	
806	2039	and 2.	808	2239	
806	2139	Sensor at	808	2339	
806	2239	100 cm	809	39	
806	2339	Worked	809	139	
807	39	Through-	809	239	
807	139	out Plot	809	339	
807	239	2	809	439	
807	339		809	539	
807	439	Repaired	809	639	
807	539	Data Logger	809	739	
807	639	Between	809	839	
807	739	Plots 1	809	939	
807	839	and 2.	809	1039	
807	939	Set For	809	1139	
807	1039	Hourly	809	1239	
807	1139	Measurement	809	1339	
807	1239		809	1439	
807	1339		809	1538	
807	1439		809	1639	
807	1539		809	1739	
807	1639		809	1838	
807	1739		809	1939	
807	1839		809	2039	
807	1939		809	2139	
807	2039		809	2239	
807	2139		809	2339	
807	2239		810	39	
807	2339		810	139	
808	39		810	239	
808	139		810	339	
808	239		810	439	
808	339		810	539	
808	439		810	639	
808	539		810	739	
808	639		810	839	
808	739		810	939	
808	839		810	1039	
808	939		810	1139	
808	1039		810	1239	
808	1139		810	1339	
808	1239		810	1439	
			810	1539	

Plot # 3 TEMPERATURE MEASUREMENT TIMES

DATE	TIME	COMMENTS	DATE	TIME	COMMENTS
821	1639	Relative	824	139	
821	1739	Humidity	824	239	
821	1839	Sensor At	824	339	
821	1939	100 cm Quit	824	439	
821	2039	Working Be-	824	539	
821	2139	tween Plots	824	639	
821	2239	2 and 3	824	739	
821	2339		824	839	
822	39		824	939	
822	139	Plot 3	824	1039	
822	239	Data Logger	824	1139	
822	739	Set For	824	1239	
822	839	Hourly	824	1339	
822	939	Measurements	824	1439	
822	1039		824	1539	
822	1139		824	1639	
822	1239		824	1739	
822	1339		824	1839	
822	1439		824	1939	
822	1539		824	2039	
822	1639		824	2139	
822	1739		824	2239	
822	1839		824	2339	
822	1939		825	39	
822	2039		825	139	
822	2139		825	239	
822	2239		825	339	
822	2339		825	439	
823	39		825	539	
823	139		825	639	
823	239		825	739	
823	339		825	839	
823	439		825	939	
823	538		825	1039	
823	639		825	1139	
823	739		825	1239	
823	839		825	1339	
823	939		825	1439	
823	1039		825	1539	
823	1139		825	1639	
823	1239		825	1739	
823	1639		825	1839	
823	1739		825	1939	
823	1839		825	2039	
823	1939		825	2139	
823	2039		825	2239	
823	2139		825	2339	
823	2239		826	39	
823	2339		826	139	
824	39		826	239	

Plot # 3 (con't) TEMPERATURE MEASUREMENT TIMES

DATE	TIME	COMMENTS	DATE	TIME	COMMENTS
826	339		828	539	
826	439		828	639	
826	539		828	739	
826	639		829	1439	
826	739				
826	839				
826	939				
826	1039				
826	1139				
826	1239				
826	1339				
826	1439				
826	1539				
826	1639				
826	1739				
826	1839				
826	1939				
826	2039				
826	2139				
826	2239				
826	2339				
827	39				
827	139				
827	239				
827	339				
827	439				
827	539				
827	639				
827	739				
827	839				
827	939				
827	1039				
827	1139				
827	1239				
827	1339				
827	1439				
827	1539				
827	1639				
827	1739				
827	1839				
827	1939				
827	2039				
827	2139				
827	2239				
827	2339				
828	39				
828	139				
828	239				
828	339				
828	439				

Plot # 4 TEMPERATURE MEASUREMENT TIMES

DATE	TIME	COMMENTS	DATE	TIME	COMMENTS
906	1515	Checks Of	911	1739	
907	1430	Equipment	911	1839	
909	1415	Prior To	911	1939	
909	1840	Full Run	911	2039	
909	1939	On Plot	911	2139	
909	2039	4	911	2239	
909	2139		911	2339	
909	2239	Hourly	912	39	
909	2339	Measurements	912	139	
910	39	For Plot	912	239	
910	139	4 Started	912	339	
910	239		912	439	
910	339		912	539	
910	439		912	639	
910	539		912	739	
910	639	Start Of	912	839	
910	739	Diurnal	912	939	
910	839		912	1039	
910	939		912	1139	
910	1039		912	1239	
910	1139		912	1339	
910	1239		912	1439	
910	1339				
910	1439				
910	1539				
910	1639				
910	1739				
910	1839				
910	1939				
910	2039				
910	2139				
910	2239				
910	2339				
911	39				
911	139				
911	239				
911	339				
911	439				
911	539				
911	639				
911	739				
911	839				
911	939				
911	1039				
911	1139				
911	1239				
911	1339				
911	1439				
911	1539				
911	1639				

APPENDIX H

AIR AND SOIL TEMPERATURE DATA

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
709	859	I	24.48	23.34	23.34	23.14	22.87	22.97	23.65	23.55	25.02	25.60
		II	25.41	24.43	24.73	23.46	23.14	23.36	23.85	24.33	26.29	26.19
		III	24.35	24.33	24.14	23.65	23.65	23.85	24.43	24.73	25.90	26.09
		AVG	25.47	24.11	24.07	23.42	23.23	23.39	23.98	24.20	25.73	25.96
709	1344	I	35.54	31.54	32.05	31.07	26.77	25.02	23.16	22.48	30.09	31.17
		II	31.36	30.58	30.78	29.21	26.19	24.82	23.85	23.55	30.58	30.78
		III	33.02	32.05	31.46	30.00	27.26	25.41	23.65	23.55	30.48	30.78
		AVG	33.31	31.39	31.43	30.09	26.74	25.08	23.55	23.20	30.39	30.91
709	1601	I	35.07	32.83	33.02	32.73	38.97	27.07	24.33	23.46	32.63	32.92
		II	32.73	31.95	32.14	30.68	28.04	26.48	24.63	24.04	33.02	33.22
		III	34.78	33.80	33.41	32.63	29.51	27.46	25.02	24.33	32.14	32.14
		AVG	34.19	32.86	32.92	32.01	32.18	27.00	24.66	23.94	32.60	32.76
710	830	I	25.21	22.87	22.87	22.48	22.68	23.07	23.55	23.75	24.82	25.02
		II	24.63	24.04	24.24	23.46	23.07	23.36	23.85	24.33	25.80	26.38
		III	24.24	23.85	23.75	23.46	23.55	23.94	24.43	25.02	24.73	25.90
		AVG	24.69	23.59	23.62	23.10	23.10	23.46	23.94	24.37	25.12	25.77

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
710	1329	I	33.90	32.34	32.14	31.75	27.17	24.92	22.58	22.09	30.19	30.58
		II	33.61	32.53	33.02	30.97	27.07	25.51	23.85	23.55	31.65	32.53
		III	34.19	32.83	32.63	31.07	27.65	25.31	23.65	23.26	30.58	32.05
		AVG	33.90	32.57	32.60	31.26	27.30	25.25	23.36	22.97	30.81	31.72
710	1503	I	31.26	31.36	31.56	31.46	29.90	26.77	24.14	23.16	29.51	30.09
		II	31.36	31.26	31.36	31.07	28.73	26.97	24.53	24.04	30.09	31.56
		III	32.24	31.75	31.85	31.36	29.31	27.26	24.82	24.14	29.80	30.97
		AVG	31.62	31.46	31.59	31.30	29.31	27.00	24.50	23.78	29.60	30.87
711	800	I	21.60	21.80	21.89	22.19	22.97	23.55	24.43	24.53	22.58	23.26
		II	22.19	22.09	22.19	22.19	22.77	23.26	24.24	24.43	23.55	23.65
		III	21.99	21.99	21.99	22.19	22.97	23.85	24.73	24.92	22.38	23.07
		AVG	21.93	21.96	22.02	22.19	22.90	23.55	24.46	24.63	22.84	23.33
711	1249	I	35.46	33.31	33.12	32.63	27.56	24.92	26.19	22.77	30.39	31.65
		II	33.41	31.75	32.34	29.61	26.29	25.21	24.24	23.94	31.36	33.51
		III	34.78	33.31	32.73	31.17	27.36	25.31	23.85	23.46	31.36	33.61
		AVG	34.55	32.79	32.73	31.13	27.07	25.15	24.76	23.39	31.04	32.92

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
711	1453	I	35.75	34.88	34.97	34.58	31.17	29.12	26.09	24.73	33.02	34.49
		II	34.39	33.90	33.90	32.73	29.61	28.04	25.60	24.92	32.53	34.09
		III	36.53	35.75	35.56	34.49	31.26	29.12	26.48	25.51	33.12	33.90
		AVG	35.56	34.84	34.81	33.93	30.68	28.76	26.06	25.05	32.89	34.16
712	859	I	23.75	22.97	23.26	23.07	22.77	23.36	24.14	24.04	25.02	25.90
		II	25.60	25.02	25.21	23.85	22.77	22.97	23.75	23.94	26.38	26.09
		III	23.07	22.87	22.77	22.87	22.97	23.46	24.53	24.63	26.38	26.77
		AVG	24.14	23.62	23.75	23.26	22.84	23.26	24.14	24.20	25.93	26.25
712	1059	I	30.68	29.02	29.12	28.24	25.02	24.04	23.75	23.55	30.97	31.56
		II	27.75	27.75	27 75	27.36	24.92	24.14	23.55	23.65	30.19	29.21
		III	30.68	29.31	28.82	27.26	24.82	24.14	24.24	24.24	29.70	30.19
		AVG	29.70	28.69	28.56	27.62	24.92	24.11	23.85	23.81	30.29	30.32
712	1329	I	34.88	34.58	34.78	33.90	28.92	26.58	24.33	23.75	31.07	32.24
		II	33.41	32.92	33.12	31.17	27.17	25.51	24.24	23.94	31.17	32.14
		III	34.58	33.70	33.31	31.85	28.63	26.48	24.73	24.33	31.36	32.14
		AVG	34.29	33.74	33.74	32.31	28.24	26.19	24.43	24.01	31.20	32.18

TEMPERATURE MEASUREMENTS FOR PLOT 1

			SOIL TEMP								AIR TEMP	
DATE	TIME	QUADRANT	1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	150 CM	30 CM
713	909	I	25.02	23.85	24.24	23.85	23.26	23.46	24.14	24.04	27.46	27.75
		II	25.80	25.12	25.31	24.24	23.07	23.07	23.85	24.04	27.46	27.95
		III	24.33	24.14	24.04	23.94	23.75	24.04	24.92	25.02	27.95	28.14
		AVG	25.05	24.37	24.53	24.01	23.36	23.52	24.30	24.37	27.62	27.95
713	1309	I	36.14	33.70	33.90	32.83	28.34	26.38	24.82	24.43	34.00	34.88
		II	33.31	31.95	32.44	29.90	26.48	25.31	24.63	24.33	33.31	33.90
		III	34.48	33.12	32.53	31.07	28.34	26.58	25.51	25.21	33.41	34.39
		AVG	34.71	32.92	32.96	31.26	27.72	26.09	24.99	24.66	33.57	34.39
713	1559	I	34.49	33.22	33.61	33.02	30.00	28.43	25.99	25.02	33.41	33.80
		II	31.95	31.36	31.56	30.19	27.95	26.87	25.31	24.82	32.53	33.02
		III	33.90	33.41	33.22	32.14	29.90	28.24	26.38	25.60	33.41	32.53
		AVG	33.44	32.66	32.79	31.78	29.28	27.85	25.90	25.15	33.12	33.12
714	839	I	23.75	22.97	23.26	23.16	22.87	23.26	23.55	23.46	25.70	25.60
		II	24.92	24.43	24.53	23.85	23.07	23.16	23.55	23.75	26.09	26.29
		III	24.04	23.94	23.85	23.65	23.75	24.14	24.73	24.82	26.38	26.68
		AVG	24.24	23.78	23.88	23.55	23.23	23.52	23.94	24.01	26.06	26.19

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
714	1428	I	35.66	34.19	34.39	33.80	30.78	28.82	25.90	24.73	34.78	35.17
		II	32.34	31.85	32.05	31.07	28.73	27.26	25.41	24.73	34.29	34.58
		III	35.56	34.78	34.58	33.41	31.95	29.02	26.58	25.70	34.29	33.02
		AVG	34.52	33.61	33.67	32.76	30.48	28.37	25.96	25.05	34.45	34.26
715	1417	I	29.31	29.41	29.70	29.61	28.53	27.85	26.19	25.51	29.12	29.21
		II	28.43	28.24	28.24	28.14	27.17	26.38	25.31	24.82	29.41	30.58
		III	29.21	28.92	29.12	28.92	28.53	27.75	26.48	25.80	30.00	30.48
		AVG	28.99	28.86	29.02	28.89	28.08	27.33	25.99	25.38	29.51	30.09
714	939	I	29.31	27.85	28.14	27.36	25.21	24.82	24.92	24.92	30.29	30.97
		II	30.87	29.80	30.09	28.24	25.51	25.02	24.92	24.92	30.78	30.97
		III	28.34	27.75	27.26	26.68	25.70	25.60	25.70	25.80	30.39	31.17
		AVG	29.51	28.47	28.50	27.43	25.47	25.15	25.18	25.21	30.48	31.04
714	1139	I	29.90	31.07	31.26	39.76	27.95	26.29	24.73	24.53	26.29	26.97
		II	28.82	29.21	29.21	29.31	27.36	26.09	24.82	24.63	26.29	26.68
		III	29.31	29.70	29.70	29.61	27.75	26.29	25.41	25.21	26.48	26.87
		AVG	29.34	30.00	30.06	32.89	27.69	26.22	24.99	24.79	26.35	26.84

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
718	839	I	21.99	21.31	21.70	21.70	21.70	22.19	22.87	23.16	21.60	22.09
		II	23.16	22.77	22.77	21.99	21.50	21.89	22.48	22.77	21.50	22.29
		III	21.60	21.70	21.89	21.89	22.29	22.77	23.36	23.65	22.19	22.68
		AVG	22.25	21.93	22.12	21.86	21.83	22.29	22.90	23.20	21.76	22.35
718	1439	I	33.61	33.02	33.22	32.44	27.75	25.51	23.65	23.46	28.43	29.51
		II	33.02	32.34	32.44	31.17	27.17	25.31	23.55	23.26	28.34	29.02
		III	34.29	33.12	32.92	31.46	27.65	25.51	24.04	23.65	29.31	30.78
		AVG	33.64	32.83	32.86	31.69	27.52	25.44	23.75	23.46	28.69	29.77
718	1639	I	33.41	32.24	32.44	32.05	28.73	26.87	24.43	23.75	28.43	30.39
		II	32.14	31.65	31.75	30.78	27.95	26.48	24.24	23.75	28.24	29.41
		III	33.51	33.12	33.02	31.85	28.82	26.77	24.63	23.94	28.04	28.53
		AVG	33.02	32.34	32.40	31.56	28.50	26.71	24.43	23.81	28.24	29.44
719	739	I	18.38	18.77	18.97	19.36	20.33	21.21	22.48	22.77	18.09	18.09
		II	18.28	18.28	18.38	18.67	19.75	20.63	21.99	22.38	17.60	17.99
		III	19.16	19.26	19.36	19.65	20.63	21.60	22.87	23.16	18.48	18.97
		AVG	18.61	18.77	18.90	19.23	20.24	21.15	22.45	22.77	18.06	18.35

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
719	1339	I	34.88	32.92	33.02	32.05	27.36	25.31	23.36	23.07	28.92	30.87
		II	33.51	32.05	32.44	29.90	25.80	24.24	22.97	22.87	28.82	30.29
		III	34.39	32.83	32.24	30.39	26.87	25.02	23.65	23.36	28.73	30.58
		AVG	34.26	32.60	32.57	30.78	26.68	24.86	23.33	23.10	28.82	30.58
719	1639	I	31.65	30.97	31.17	30.68	27.85	26.38	23.65	22.77	29.21	30.58
		II	31.26	30.58	30.87	29.61	26.77	25.21	23.46	22.68	29.80	30.97
		III	34.19	33.02	32.73	21.80	28.82	26.97	24.43	23.65	29.41	29.61
		AVG	32.37	31.52	31.59	27.36	27.82	26.19	23.85	23.03	29.48	30.39
720	836	I	21.02	21.02	21.21	21.21	21.41	22.09	23.16	23.46	22.48	22.68
		II	22.87	22.19	22.48	21.60	21.60	21.70	22.77	23.07	22.19	23.16
		III	21.41	21.31	21.31	21.41	21.80	22.58	23.55	23.94	23.55	24.24
		AVG	21.76	21.50	21.67	21.41	21.60	22.12	23.16	23.49	22.74	23.36
720	1239	I	30.68	30.00	30.19	29.51	26.19	24.63	23.16	23.07	28.24	29.41
		II	28.73	27.95	28.14	26.97	24.82	24.14	23.07	22.97	27.85	28.73
		III	30.87	30.09	29.70	28.73	26.19	24.63	23.75	23.55	28.92	30.97
		AVG	30.09	29.34	29.34	28.40	25.73	24.46	23.33	23.20	28.34	29.70

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
720	1939	I	25.02	26.48	26.77	27.56	27.26	26.77	24.92	23.65	24.04	23.75
		II	25.02	25.12	25.21	26.09	26.38	25.90	24.53	23.85	24.04	23.75
		III	27.56	27.85	28.14	28.73	28.92	28.04	25.99	24.92	24.63	24.04
		AVG	25.84	26.48	26.71	27.46	27.52	26.90	25.15	24.14	24.24	23.85
721	739	I	18.09	18.58	18.67	19.16	20.24	20.92	22.29	22.38	17.70	17.50
		II	18.19	18.19	18.38	18.77	19.55	20.53	21.89	22.19	16.72	17.60
		III	19.45	19.55	19.65	20.14	21.11	22.09	23.16	23.46	18.48	18.77
		AVG	18.58	18.77	18.90	19.36	20.30	21.18	22.45	22.68	17.63	17.96
721	1539	I	35.75	34.39	34.58	33.90	29.51	27.17	24.24	23.46	22.48	34.39
		II	32.44	31.46	31.65	30.29	27.65	25.99	23.94	23.36	32.73	33.41
		III	37.22	35.66	35.27	33.70	29.80	27.17	24.43	24.14	30.87	30.58
		AVG	35.14	33.83	33.83	32.63	28.99	26.77	24.20	23.65	28.69	32.79
722	1439	I	34.58	34.00	34.19	33.61	28.92	26.38	23.65	22.97	29.41	30.78
		II	32.53	22.38	22.38	31.36	27.75	25.51	23.46	23.07	29.51	31.17
		III	34.97	34.19	34.09	32.83	29.12	26.68	24.53	23.94	30.29	32.53
		AVG	34.03	30.19	30.22	32.60	28.60	26.19	23.88	23.33	29.74	31.49

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
723	1039	I	29.31	28.24	28.43	27.36	24.33	23.46	23.36	23.46	28.43	28.43
		II	28.63	28.14	28.43	27.26	24.53	23.55	23.16	23.26	28.43	28.82
		III	28.43	27.85	27.46	26.48	24.53	23.94	23.94	24.14	28.63	29.31
		AVG	28.79	28.08	28.11	27.04	24.46	23.65	23.49	23.62	28.50	28.86
723	1439	I	32.34	30.39	30.68	30.39	27.85	26.29	24.33	23.75	32.34	33.02
		II	30.58	29.80	30.00	28.92	26.87	25.51	24.04	23.65	32.53	33.90
		III	32.92	31.65	31.36	30.29	28.14	26.58	24.92	24.43	32.73	33.70
		AVG	31.95	30.61	30.68	29.87	27.62	26.12	24.43	23.94	32.53	33.54
723	1839	I	26.58	27.65	27.95	28.53	27.65	26.68	24.92	24.04	28.82	28.63
		II	26.87	27.07	26.87	27.56	26.97	26.19	24.63	23.94	28.92	28.92
		III	28.82	29.12	29.31	29.61	28.82	27.65	25.90	25.12	29.51	29.31
		AVG	27.43	27.95	28.04	28.56	27.82	26.84	25.15	24.37	29.08	28.95
724	939	I	27.65	25.51	25.70	25.12	23.85	23.65	23.85	23.85	28.73	29.02
		II	27.85	26.77	27.07	25.80	24.14	23.75	23.75	23.85	29.12	30.09
		III	26.68	25.90	25.60	25.02	24.43	24.43	24.63	24.73	29.70	31.07
		AVG	27.39	26.06	26.12	25.31	24. 4	23.94	24.07	24.14	29.18	30.06

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
724	1339	I	31.95	31.07	31.36	30.97	27.95	26.29	24.53	24.04	31.36	31.85
		II	30.87	30.19	30.39	29.41	26.77	25.41	24.24	24.04	32.05	33.02
		III	31.95	30.97	30.78	30.09	28.04	26.58	25.12	24.73	32.63	33.51
		AVG	31.59	30.74	30.84	30.16	27.59	26.09	24.63	24.27	32.01	32.79
724	1739	I	31.36	31.17	31.36	31.46	28.92	27.26	25.12	24.24	32.73	32.24
		II	30.68	30.58	30.78	30.39	28.34	26.87	25.02	24.33	33.51	33.61
		III	33.80	33.31	33.22	32.63	30.29	28.24	26.19	25.41	33.90	34.88
		AVG	31.95	31.69	31.78	31.49	29.18	27.46	25.44	24.66	33.38	33.57
725	839	I	26.09	24.63	24.82	24.73	24.53	24.73	24.92	24.92	27.65	28.04
		II	26.38	25.41	25.70	24.53	23.85	24.24	24.63	24.63	27.65	28.92
		III	25.31	25.12	25.02	24.82	24.82	25.02	25.31	25.31	27.75	28.14
		AVG	25.93	25.05	25.18	24.69	24.40	24.66	24.95	24.95	27.69	28.37
725	1239	I	29.02	28.92	29.21	28.92	26.77	25.80	24.53	24.24	28.34	28.43
		II	29.41	29.21	29.41	28.73	26.77	25.80	24.73	24.43	28.43	29.12
		III	30.00	29.70	29.61	29.02	27.36	26.29	25.31	25.02	29.02	29.70
		AVG	29.48	29.28	29.41	28.89	26.97	25.96	24.86	24.56	28.60	29.08

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
725	1639	I	34.09	32.34	32.53	32.14	28.82	27.17	24.92	24.14	34.00	34.19
		II	33.12	32.24	32.44	31.07	28.43	27.46	25.21	24.53	34.49	35.27
		III	36.63	25.60	25.12	33.31	30.19	28.04	25.99	25.41	34.49	33.12
		AVG	34.62	30.06	30.03	32.18	29.15	27.56	25.38	24.69	34.32	34.19
726	601	I	22.29	22.77	22.87	23.36	24.14	24.63	24.92	24.92	21.80	21.80
		II	22.38	22.48	22.48	22.97	23.75	24.33	25.02	25.02	21.80	21.80
		III	22.97	23.16	23.26	23.55	24.43	25.02	25.60	25.51	21.89	21.80
		AVG	22.55	22.81	22.87	23.29	24.11	24.66	25.18	25.15	21.83	21.80
726	802	I	22.77	23.07	23.26	23.36	23.65	24.04	24.43	24.53	23.65	23.46
		II	23.07	23.07	22.97	23.16	23.46	23.85	24.43	24.53	23.46	23.46
		III	23.65	23.75	23.85	23.85	24.33	24.82	25.31	25.31	23.85	23.94
		AVG	23.16	23.29	23.36	23.46	23.81	24.24	24.73	24.79	23.65	23.62
726	1039	I	25.41	24.63	24.63	24.53	24.14	24.04	24.14	24.24	25.90	25.90
		II	24.92	24.43	24.73	24.33	23.75	23.85	24.04	24.14	25.99	26.38
		III	25.60	25.21	25.12	24.92	24.63	24.63	24.82	24.92	26.38	26.87
		AVG	25.31	24.76	24.82	24.60	24.17	24.17	24.33	24.43	26.09	26.38

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
724	1234	I	26.29	25.80	26.09	25.80	24.63	24.43	24.14	24.14	27.17	27.56
		II	26.77	26.48	26.58	25.90	24.73	24.33	24.24	24.24	27.75	28.73
		III	27.46	26.97	26.87	26.29	25.51	25.12	24.92	24.82	28.14	28.82
		AVG	26.84	26.42	26.51	25.99	24.95	24.63	24.43	24.40	27.69	28.37
724	1400	I	28.92	28.43	28.73	28.14	25.99	25.12	24.53	24.33	28.82	29.12
		II	29.51	29.21	29.41	28.34	26.29	25.31	24.63	24.63	29.02	30.00
		III	30.29	29.80	29.61	28.82	26.77	25.90	25.12	25.02	29.90	30.58
		AVG	29.57	29.15	29.25	28.43	26.35	25.44	24.76	24.66	29.25	29.90
724	1632	I	27.36	27.75	28.04	28.24	27.07	26.19	24.82	24.43	27.36	27.46
		II	28.34	28.34	28.43	28.34	27.26	26.48	25.12	24.63	27.36	28.14
		III	29.12	29.21	29.31	29.21	28.24	27.17	25.70	25.31	27.65	28.14
		AVG	28.27	28.43	28.60	28.60	27.52	26.61	25.21	24.79	27.46	27.91
724	1816	I	25.02	25.90	25.99	26.48	26.09	25.51	24.43	24.04	25.70	25.80
		II	26.09	25.99	25.90	26.29	25.99	25.70	24.63	24.24	25.41	25.90
		III	27.07	27.26	27.36	27.36	27.26	26.58	25.51	24.92	25.99	26.19
		AVG	26.06	26.38	26.42	26.71	26.45	25.93	24.86	24.40	25.70	25.96

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	AIR TEMP 30 CM
726	1957	I	24.14	25.12	25.21	25.70	26.09	25.99	25.31	24.82	24.82	24.73
		II	25.02	25.31	25.31	25.70	25.99	26.09	25.51	25.12	24.82	24.82
		III	25.70	25.99	26.19	26.58	26.77	26.58	25.99	25.02	24.92	24.92
		AVG	24.95	25.47	25.57	25.99	26.29	26.22	25.60	24.99	24.86	24.82

TEMPERATURE MEASUREMENTS FOR PLOT 2

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
804	1139	I	32.44	31.24	31.36	28.82	26.29	25.21	24.43	24.43	32.05	31.65
		II	24.38	26.29	26.38	26.29	25.41	25.21	24.53	24.24	32.05	32.63
		III	31.34	29.02	28.34	27.36	26.77	25.41	25.21	25.31	32.92	34.88
		AVG	30.06	28.86	28.69	27.49	26.16	25.28	24.73	24.66	32.34	33.05
804	1539	I	39.27	38.00	38.29	34.88	31.65	29.70	26.97	26.09	36.44	37.61
		II	33.31	34.00	32.73	31.95	28.04	27.56	25.99	25.31	37.51	40.05
		III	34.48	33.41	33.41	32.73	31.95	29.51	27.56	26.58	36.14	37.02
		AVG	35.75	35.20	34.81	33.18	30.55	28.92	26.84	25.99	36.70	38.23
807	939	I	28.63	27.46	27.56	25.60	24.04	23.94	24.73	24.82	29.31	29.80
		II	30.00	29.02	27.95	26.29	24.43	24.33	24.43	24.73	29.41	30.48
		III	24.87	25.60	25.31	24.92	24.92	25.12	25.60	25.99	30.09	31.65
		AVG	28.50	27.36	26.94	25.60	24.46	24.46	24.92	25.18	29.61	30.65
807	1339	I	39.07	37.41	37.71	34.88	30.48	28.14	25.80	25.31	35.36	35.95
		II	35.36	34.88	32.92	31.07	26.58	26.29	25.31	24.92	35.17	37.61
		III	37.22	34.09	33.41	32.05	30.78	28.14	26.77	26.38	35.66	37.41
		AVG	37.22	35.53	34.68	32.66	29.28	27.52	25.96	25.54	35.40	36.99

TEMPERATURE MEASUREMENTS FOR PLOT 2

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
807	1639	I	37.41	34.63	34.73	34.68	31.95	30.00	26.97	25.99	34.68	36.24
		II	31.56	31.85	31.36	31.07	28.24	27.75	25.99	25.21	35.17	37.22
		III	33.41	32.44	32.34	32.14	31.56	29.80	27.95	26.97	34.19	34.29
		AVG	34.13	33.64	33.48	32.63	30.58	29.18	26.97	26.06	34.68	35.92
808	839	I	24.53	23.75	23.46	23.07	22.77	23.36	24.24	24.53	24.63	25.02
		II	26.48	25.70	25.02	24.43	24.43	24.53	25.02	25.60	26.29	27.73
		III	24.73	24.73	24.82	24.92	25.21	25.90	26.48	26.68	26.58	27.75
		AVG	25.25	24.73	24.43	24.14	24.14	24.60	25.25	25.60	25.83	26.84
808	1339	I	39.46	37.80	37.80	35.07	30.48	28.14	26.09	25.80	33.51	34.58
		II	35.46	34.88	33.12	31.46	27.07	26.77	25.70	25.41	33.51	35.17
		III	36.24	33.31	32.73	31.65	30.58	28.53	25.41	26.97	33.70	36.05
		AVG	37.06	35.33	34.55	32.73	29.38	27.82	25.73	26.06	33.57	35.27
808	1539	I	40.15	38.97	39.17	36.24	32.92	30.58	27.75	26.87	34.49	35.07
		II	33.61	34.29	33.31	32.73	28.92	28.43	26.68	25.99	34.09	35.85
		III	34.29	33.90	33.80	33.41	32.73	30.48	28.63	27.75	33.61	34.39
		AVG	36.01	35.72	35.43	34.13	31.52	29.83	27.69	26.87	34.06	35.19

TEMPERATURE MEASUREMENTS FOR PLOT 2

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
809	939	I	27.85	26.97	26.97	25.41	24.43	24.43	25.12	25.21	27.46	27.85
		II	29.12	28.43	27.46	26.48	24.92	24.92	25.02	25.12	28.34	29.80
		III	27.17	26.38	26.19	25.99	25.99	26.29	26.58	26.77	28.63	30.00
		AVG	28.04	27.26	26.87	25.96	25.12	25.21	25.57	25.70	28.14	29.21
809	1639	I	34.68	34.68	34.68	33.22	31.75	30.00	27.36	26.48	30.39	30.97
		II	31.26	31.17	30.97	30.78	28.24	27.85	26.48	25.70	31.07	32.14
		III	32.73	32.14	32.14	31.75	31.36	29.80	28.24	27.56	30.97	31.75
		AVG	32.89	32.66	32.60	31.92	30.45	29.21	27.36	26.58	30.81	31.62
810	939	I	23.26	23.16	22.97	22.87	22.68	23.46	24.14	24.14	24.24	24.04
		II	24.53	24.43	24.43	24.24	24.14	24.04	24.53	24.43	25.12	25.31
		III	25.51	25.21	25.31	25.21	25.21	25.41	25.90	26.09	25.12	25.21
		AVG	24.43	24.27	24.24	24.11	24.01	24.30	24.86	24.89	24.82	24.86
810	1539	I	38.10	38.10	38.19	35.95	32.14	29.80	27.07	26.58	32.14	32.53
		II	33.02	33.41	32.53	31.75	27.95	27.65	26.29	25.70	33.31	34.09
		III	34.97	34.09	33.80	33.31	32.34	30.09	28.34	27.65	33.90	34.39
		AVG	35.36	35.20	34.84	33.67	30.81	29.18	27.23	26.64	33.12	33.67

TEMPERATURE MEASUREMENTS FOR PLOT 3

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
821	1639	I	30.27	34.68	36.05	26.78	27.61	25.60	24.09	25.12	33.12	34.19
		II	31.63	31.46	31.26	30.68	28.92	26.48	25.31	24.33	33.02	34.78
		III	29.31	29.31	29.21	29.31	28.73	27.85	25.99	25.51	31.85	31.75
		AVG	32.14	31.62	32.18	29.57	29.08	26.71	25.80	24.99	32.66	33.57
822	939	I	22.09	22.09	22.38	22.46	22.58	23.16	23.07	23.46	22.29	22.19
		II	21.89	21.60	21.30	21.31	21.11	21.70	22.19	22.38	22.29	22.77
		III	22.19	21.80	21.60	21.70	21.50	21.70	22.58	22.87	21.31	22.09
		AVG	22.06	21.83	21.83	21.83	21.73	22.19	22.61	22.90	21.96	22.35
822	1339	I	35.76	33.80	35.95	25.21	26.09	23.46	23.65	23.36	31.36	31.07
		II	32.05	29.70	29.02	28.34	25.21	23.46	23.16	23.16	30.97	32.05
		III	34.29	31.95	30.78	24.04	27.07	25.31	24.04	23.94	35.46	34.29
		AVG	34.03	31.82	31.92	25.86	26.12	24.07	23.62	23.49	32.60	32.47
822	1639	I	34.78	34.09	33.80	28.63	30.09	25.51	25.90	24.73	33.70	35.07
		II	30.78	30.19	30.00	29.90	28.14	25.80	24.53	23.85	33.90	35.17
		III	29.80	29.80	30.00	30.09	29.41	28.24	26.09	25.31	31.95	33.02
		AVG	31.78	31.36	31.26	29.54	29.21	26.51	25.51	24.63	33.18	34.42

TEMPERATURE MEASUREMENTS FOR PLOT 3

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
823	939	I	26.87	25.31	24.43	22.68	22.48	23.36	23.46	23.75	25.51	25.02
		II	26.29	24.63	23.85	23.07	21.60	21.50	22:19	22.38	23.75	24.43
		III	23.94	23.07	21.80	21.11	21.11	21.41	22.77	23.07	27.17	26.19
		AVG	25.70	24.33	23.36	22.29	21.73	22.09	22.81	23.07	25.47	25.21
823	1239	I	35.07	33.51	31.65	25.31	25.80	23.85	24.04	23.85	29.31	30.48
		II	29.70	27.56	26.87	25.90	23.36	22.38	22.38	22.48	27.36	28.63
		III	33.31	31.75	29.61	27.36	25.41	23.85	23.16	22.97	29.31	28.34
		AVG	32.70	30.94	29.38	26.19	24.86	23.36	23.20	23.10	28.66	29.15
823	1639	I	33.22	32.63	31.95	28.24	29.12	26.19	26.38	25.41	32.05	33.12
		II	27.95	27.85	27.65	27.46	26.68	25.21	24.24	23.55	30.39	31.36
		III	28.14	28.04	28.43	28.73	28.34	27.56	25.99	25.51	29.41	29.90
		AVG	29.77	29.51	29.34	28.14	28.04	26.32	25.54	24.82	30.61	31.46
824	839	I	21.41	21.31	21.11	22.09	21.89	23.46	23.36	23.85	22.97	22.38
		II	21.89	20.82	20.24	20.14	20.04	21.02	21.80	22.19	23.07	23.75
		III	20.14	19.75	19.65	20.24	20.72	21.41	22.77	23.07	24.04	24.33
		AVG	21.15	20.63	20.33	20.82	20.89	21.96	22.64	23.03	23.36	23.49

TEMPERATURE MEASUREMENTS FOR PLOT 3

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
824	1539	I	35.44	34.68	33.90	28.04	29.31	25.51	25.70	24.73	31.65	32.34
		II	33.02	31.46	30.78	30.19	27.36	24.92	24.04	23.46	30.48	31.17
		III	30.29	30.39	30.58	30.29	29.21	27.75	25.51	24.92	29.02	30.29
		AVG	32.92	32.18	31.75	29.51	28.63	26.06	25.08	24.37	30.39	31.26
825	1439	I	40.63	38.68	36.93	27.75	29.70	24.24	24.53	23.46	29.12	31.65
		II	35.75	33.02	32.14	31.46	26.87	24.04	23.07	22.58	30.09	31.26
		III	37.51	35.95	33.30	31.56	28.92	26.77	24.43	24.04	29.21	31.07
		AVG	37.97	35.88	34.29	30.26	28.50	25.02	24.01	23.36	29.48	31.33
826	1639	I	34.29	33.12	32.73	28 14	29.41	25.02	25.51	24.24	29.90	29.70
		II	29.41	29.02	28.92	28.82	27.07	24.92	23.75	22.97	29.90	30.68
		III	30.68	30.68	30.48	30.29	29.12	27.95	25.80	25.21	29 61	30.00
		AVG	31.46	30.94	30.71	29.08	28.53	25.96	25.02	24.14	29.80	30.13
827	1039	I	28.92	27.85	26.68	23.07	23.26	22.87	22.87	22.87	25.60	26.58
		II	24.53	24.14	23.94	23.75	22.48	22.48	22.58	22.58	26.48	26.58
		III	27.36	26.77	24.92	23.55	22.97	22.68	22.87	22.97	26.29	26.48
		AVG	26.94	26.25	25.18	23.46	22.90	22.68	22.77	22.81	26.12	26.55

TEMPERATURE MEASUREMENTS FOR PLOT 3

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
828	739	I	20.82	21.31	21.60	22.77	22.58	23.36	23.36	23.65	20.43	20.63
		II	21.31	21.31	21.41	21.41	21.60	22.29	22.77	22.87	21.11	20.92
		III	21.99	22.09	22.29	22.77	23.16	23.55	24.33	24.53	20.82	21.11
		AVG	21.37	21.57	21.76	22.32	22.45	23.07	23.49	23.68	20.79	20.89
829	1439	I	37.80	36.63	34.78	27.17	28.43	24.63	24.82	24.04	32.63	32.83
		II	30.29	29.51	29.80	29.31	27.46	25.02	25.21	23.85	33.51	33.70
		III	32.44	31.95	30.87	29.70	28.34	26.97	25.12	24.92	32.44	33.51
		AVG	33.51	32.70	31.82	28.73	28.08	25.54	25.05	24.27	32.86	33.35

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
904	1515	I	29.51	30.09	29.80	25.60	25.99	23.46	23.65	22.97	29.61	30.09
		II	29.12	28.92	28.63	28.92	25.51	23.55	22.97	22.77	29.70	30.19
		III	30.78	30.68	30.29	29.70	28.14	26.68	24.63	24.24	29.21	29.80
		AVG	29.80	29.90	29.57	28.08	26.55	24.56	23.75	23.33	29.51	30.03
907	1430	I	37.32	35.66	34.29	26.19	27.46	23.94	24.14	23.65	30.58	34.00
		II	31.65	30.39	29.61	29.21	23.94	22.77	22.48	22.58	28.92	29.51
		III	34.29	33.22	32.05	29.90	27.75	26.19	24.43	24.43	28.24	30.29
		AVG	34.42	33.09	31.98	28.43	26.38	24.30	23.68	23.55	29.25	31.26
909	1415	I	38.49	36.05	34.29	25.70	27.46	23.07	23.16	22.77	31.07	34.39
		II	33.22	30.29	29.12	28.43	22.19	20.82	20.63	20.82	29.70	30.58
		III	33.70	32.05	30.78	28.24	25.80	24.24	22.77	22.58	30.00	31.75
		AVG	35.14	32.79	31.39	27.46	25.15	22.71	22.19	22.06	30.26	32.24
910	639	I	15.84	16.53	17.60	21.41	20.92	23.26	23.16	23.65	11.06	10.18
		II	13.70	14.38	14.87	15.26	18.19	20.04	20.92	21.50	11.45	10.28
		III	15.55	16.14	16.92	18.28	19.65	20.53	22.38	22.68	10.87	10.28
		AVG	15.03	15.68	16.46	18.32	19.58	21.28	22.15	22.61	11.13	10.25

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
910	739	I	15.75	16.33	17.11	20.82	20.24	22.48	22.38	22.97	15.45	12.92
		II	15.36	15.36	15.45	15.75	17.80	19.45	20.63	21.21	13.79	14.77
		III	15.65	16.14	16.72	17.89	19.26	20.43	22.29	22.77	16.04	16.92
		AVG	15.58	15.94	16.43	18.15	19.10	20.79	21.76	22.32	15.10	14.87
910	939	I	24.04	23.07	21.89	20.72	20.33	21.80	21.80	22.29	22.48	23.36
		II	17.99	17.99	17.89	17.99	17.89	18.87	19.55	20.53	21.70	22.97
		III	20.43	19.55	19.26	18.77	18.97	19.55	21.31	21.80	23.55	23.85
		AVG	20.82	20.20	19.68	19.16	19.06	20.07	20.89	21.54	22.58	23.39
910	1139	I	32.44	30.58	28.82	22.68	23.16	22.29	22.19	22.48	28.34	29.21
		II	21.11	20.53	20.33	20.33	19.55	19.45	19.75	20.33	27.65	28.34
		III	27.75	26.38	25.12	22.97	21.60	20.82	21.11	21.50	32.24	30.19
		AVG	27.10	25.83	24.76	21.99	21.44	20.85	21.02	21.44	29.41	29.25
910	1339	I	37.61	35.17	33.51	25.21	26.09	22.87	23.07	22.68	32.44	34.19
		II	31.46	28.24	27.07	26.29	21.21	20.63	20.63	20.92	30.78	31.65
		III	32.63	31.07	29.61	27.46	25.41	23.94	22.58	22.48	31.65	31.46
		AVG	33.90	31.49	30.06	26.32	24.24	22.48	22.09	22.02	31.62	32.44

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
910	1539	I	37.90	36.34	35.36	27.56	29.41	24.33	24.73	23.55	32.53	35.36
		II	35.07	31.95	30.58	30.19	24.82	22.29	21.50	21.21	30.87	31.95
		III	31.56	31.17	30.78	29.70	27.75	26.19	23.75	23.26	29.51	30.87
		AVG	34.84	33.15	32.24	29.15	27.33	24.27	23.33	22.68	30.97	32.73
910	1739	I	33.02	33.61	33.61	29.41	30.87	26.09	26.58	25.12	30.78	30.68
		II	29.02	28.14	27.65	27.75	25.99	24.14	22.97	22.38	30.39	31.26
		III	30.48	30.29	30.09	29.80	28.73	27.56	25.51	25.02	29.80	30.39
		AVG	30.84	30.68	30.45	28.99	28.53	25.93	25.02	24.17	30.32	30.78
910	1939	I	26.68	27.75	28.63	28.53	29.21	26.68	26.97	25.70	22.97	22.19
		II	22.97	23.55	23.65	23.94	24.63	24.04	23.26	25.51	22.77	22.19
		III	25.02	25.80	26.29	27.17	27.26	26.87	25.51	24.92	22.29	21.89
		AVG	24.89	25.70	26.19	26.55	27.04	25.86	25.25	25.38	22.68	22.09
910	2239	I	21.21	22.19	22.87	25.60	25.41	25.80	25.90	25.51	18.48	16.72
		II	18.67	19.26	19.36	19.75	21.80	22.58	22.87	22.68	18.87	17.80
		III	20.43	21.11	21.80	22.97	23.85	24.63	24.92	24.73	18.87	18.09
		AVG	20.11	20.85	21.34	22.77	23.68	24.33	24.56	24.30	18.74	17.54

TEMPERATURE MEASUREMENTS FOR PLOT 4

			SOIL TEMP								AIR TEMP	
DATE	TIME	QUADRANT	1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	150 CM	30 CM
911	439	I	17.11	17.70	18.58	21.70	21.21	22.97	22.87	23.26	13.89	13.01
		II	15.75	16.14	16.33	16.82	18.87	20.33	21.02	21.41	14.57	13.79
		III	16.82	17.41	17.89	19.36	20.33	21.21	22.68	22.97	14.28	13.79
		AVG	16.56	17.08	17.60	19.29	20.14	21.50	22.19	22.55	14.25	13.53
911	1539	I	36.05	34.78	34.00	27.46	29.21	24.33	24.53	23.55	32.34	34.88
		II	33.51	30.87	29.70	29.41	25.12	22.77	21.99	21.50	31.07	31.65
		III	31.17	30.87	30.48	29.51	27.75	26.29	23.94	23.55	30.19	30.78
		AVG	33.57	32.13	31.39	28.79	27.36	24.46	23.49	22.87	31.20	32.44
912	1439	I	30.29	29.02	28.43	24.63	25.21	22.87	23.16	22.38	26.77	29.41
		II	30.68	27.85	26.97	26.19	22.77	21.70	22.77	22.97	27.85	29.70
		III	28.73	28.53	27.46	26.09	23.75	23.36	22.38	22.48	26.58	27.07
		AVG	29.90	28.47	27.62	25.64	23.91	22.64	22.77	22.61	27.07	28.73

APPENDIX I

PLOT 1 DIURNAL CYCLE DATA

I.1

REFLECTIVITY DATA

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 1, Diurnal Cycle

POLARIZATION: H
INCIDENCE ANGLE: 45°

FREQUENCY (GHz)

DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
7/26	615	.447	.429	.465	.473	.457	.447	.447
	815	.449	.417	.452	.452	.434	.417	.419
	1000	.454	.424	.465	.473	.468	.447	.460
	1220	.442	.437	.479	.468	.473	.457	.454
	1405	.439	.422	.470	.473	.468	.452	.462
	1612	.452	.437	.479	.479	.465	.457	.447
	1755	.427	.410	.454	.468	.452	.439	.444
	2010	.457	.439	.490	.490	.481	.479	.470

FREQUENCY (GHz)

	5.0	5.5	6.0	6.5	7.0	7.5
620	.335	.351	.367	.351	.320	.259
810	.374	.398	.398	.367	.361	.339
1005	.355	.351	.324	.300	.292	.259
1215	.359	.361	.351	.316	.295	.269
1410	.341	.327	.316	.307	.299	.280
1605	.365	.347	.331	.313	.307	.287
1810	.341	.341	.322	.302	.316	.311
2000	.324	.355	.359	.313	.304	.292

I.2

GRAVIMETRIC MOISTURE DATA

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

lot No. 1, Diurnal Cycle Date: 7/26/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0600	I	.181	.094	.153	.141	.142	.156	----
	II	.136	.129	.171	.224	.165	.235	.160
	III	.089	.150	.097	.129	.116	.155	.162
	IV	.078	.102	.144	----	.108	.129	.147
Plot mean		.121	.119	.141	.165	.133	.169	.156
0800	I	.104	.046	.072	.080	.076	.133	.130
	II	.171	.145	.178	.172	.167	.145	.155
	III	.210	.223	.118	.085	.159	.167	.165
	IV	.056	.142	.146	.153	.124	.154	.147
Plot mean		.135	.139	.129	.123	.131	.150	.149
1000	I	.043	.094	.075	.086	.075	.164	----
	II	.160	.179	.153	.168	.165	.106	.149
	III	.075	.162	.161	.116	.129	.148	.160
	IV	.023	.057	.118	.134	.083	.152	.160
Plot mean		.075	.123	.127	.126	.113	.143	.156

C-(BB) 3

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1, Diurnal Cycle — Date: 7/26/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1200	I	.098	.109	.208	.074	.122	.139	.169
	II	.198	.137	.183	.171	.172	----	----
	III	.054	.141	.121	.126	.111	.167	.231
	IV	.120	.099	.117	.107	.111	.135	.145
Plot mean		.118	.122	.157	.120	.129	.147	.182
1400	I	.070	.113	.106	.174	.116	.160	.163
	II	.229	.255	.186	.197	.217	.222	.156
	III	.104	.174	.222	.188	.172	.194	.165
	IV	.113	.154	.147	.149	.141	.168	.157
Plot mean		.129	.174	.165	.177	.161	.186	.160
1600	I	.128	----	.179	----	.154	.163	.145
	II	.112	.133	.134	.147	.132	.196	.221
	III	.015	.039	.084	.147	.071	.142	.157
	IV	.176	.085	.105	.110	.119	.143	.143
Plot mean		.108	.086	.126	.135	.119	.161	.167

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

Plot No. 1, Diurnal Cycle Date: 7/26/79

		DEPTH INTERVAL (CM)						
Time	Quad	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1800	I	.000	.017	.070	.104	.048	.155	.160
	II	.210	.227	.164	.176	.194	.184	.151
	III	.000	.008	.069	.143	.055	.144	.170
	IV	.029	.113	.127	.125	.099	.153	.151
Plot mean		.060	.091	.108	.137	.099	.159	.158
2000	I	.019	.032	.089	.150	.073	.160	.145
	II	.197	.121	.153	.110	.145	.183	.161
	III	.120	.130	.132	.166	.137	.163	----
	IV	.088	.110	.131	.154	.121	.151	.159
Plot mean		.106	.098	.126	.145	.119	.164	.155

I.3

VOLUMETRIC MOISTURE DATA

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1, Diurnal Cycle DATE: 7/26/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
0600	I	.272	.141	.230	.212	.213	.234	---
	II	.204	.194	.257	.336	.248	.353	.240
	III	.134	.225	.146	.194	.174	.233	.243
	IV	.117	.153	.216	---	.162	.194	.221
PLOT MEAN		.182	.179	.212	.248	.200	.254	.234
0800	I	.156	.069	.108	.120	.114	.200	.195
	II	.257	.218	.267	.258	.251	.218	.233
	III	.315	.335	.177	.128	.239	.251	.248
	IV	.084	.213	.219	.230	.186	.231	.221
PLOT MEAN		.203	.209	.194	.185	.197	.225	.224
1000	I	.065	.141	.113	.129	.113	.246	---
	II	.240	.269	.230	.252	.248	.159	.224
	III	.113	.243	.242	.174	.194	.222	.240
	IV	.035	.086	.177	.201	.125	.228	.240
PLOT MEAN		.113	.185	.191	.189	.170	.215	.234

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1, Diurnal Cycle DATE: 7/26/79

		DEPTH INTERVAL (CM)						
TIME	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2-4
1200	I	.147	.164	.312	.111	.183	.209	.254
	II	.297	.206	.275	.257	.258	---	---
	III	.081	.212	.182	.189	.167	.251	.347
	IV	.180	.149	.176	.161	.167	.203	.218
PLOT MEAN		.177	.183	.236	.180	.194	.221	.273
1400	I	.105	.170	.159	.261	.174	.240	.245
	II	.344	.383	.279	.296	.326	.333	.234
	III	.156	.261	.333	.282	.258	.291	.248
	IV	.170	.231	.221	.224	.212	.252	.236
PLOT MEAN		.194	.261	.248	.266	.242	.279	.240
1600	I	.192	---	.269	---	.231	.245	.218
	II	.168	.200	.201	.221	.198	.294	.332
	III	.023	.059	.126	.221	.107	.213	.236
	IV	.264	.128	.158	.165	.178	.215	.215
PLOT MEAN		.162	.129	.189	.203	.179	.242	.251

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 1, Diurnal Cycle

DATE: 7/26/79

		DEPTH INTERVAL (CM)						
TIME →	QUAD	0-.25	.25-.5	.5-.75	.75-1	0-1	1-2	2.4
1800	I	.000	.026	.105	.156	.072	.233	.240
	II	.315	.341	.246	.264	.291	.276	.227
	III	.000	.012	.104	.215	.083	.216	.255
	IV	.044	.170	.191	.188	.149	.230	.227
PLOT MEAN		.090	.137	.162	.206	.149	.239	.237
2000	I	.029	.048	.134	.225	.110	.240	.218
	II	.296	.182	.230	.165	.218	.275	.242
	III	.180	.195	.198	.249	.206	.245	---
	IV	.132	.165	.197	.231	.182	.227	.239
PLOT MEAN		.159	.147	.189	.218	.179	.246	.233

I.4

AIR AND SOIL TEMPERATURE DATA

TEMPERATURE MEASUREMENTS FOR PLOT 1

			SOIL TEMP								AIR TEMP	
DATE	TIME	QUADRANT	1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	150 CM	30 CM
724	801	T	22.29	22.77	22.87	23.34	24.14	24.43	24.92	24.92	21.80	21.80
		TT	22.38	22.48	22.48	22.97	23.75	24.33	25.02	25.02	21.80	21.80
		TTT	22.97	23.14	23.24	23.55	24.43	25.02	25.60	25.51	21.89	21.80
		AVG	22.55	22.81	22.87	23.29	24.11	24.66	25.18	25.15	21.83	21.80
724	802	T	22.77	23.07	23.24	23.34	23.65	24.04	24.43	24.53	23.65	23.46
		TT	23.07	23.07	22.97	23.14	23.46	23.85	24.43	24.53	23.46	23.46
		TTT	23.65	23.75	23.85	23.85	24.33	24.82	25.31	25.31	23.85	23.94
		AVG	23.16	23.29	23.34	23.46	23.81	24.24	24.73	24.79	23.65	23.62
724	1039	T	25.41	24.63	24.63	24.53	24.14	24.04	24.14	24.24	25.90	25.90
		TT	24.92	24.43	24.73	24.33	23.75	23.85	24.04	24.14	25.99	24.38
		TTT	25.60	25.21	25.12	24.92	24.63	24.63	24.82	24.92	24.38	24.87
		AVG	25.31	24.76	24.82	24.60	24.17	24.17	24.33	24.43	24.09	24.38
724	1234	T	24.29	25.80	24.09	25.80	24.63	24.63	24.14	24.14	27.17	27.54
		TT	24.77	24.48	24.58	25.90	24.73	24.33	24.24	24.24	27.75	28.73
		TTT	27.44	24.97	24.87	24.99	25.51	25.12	24.92	24.82	28.14	28.82
		AVG	24.84	24.63	24.51	25.99	24.95	24.63	24.43	24.40	27.69	28.37

TEMPERATURE MEASUREMENTS FOR PLOT 1

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
7?A	1400	I	?8.?? ?8.43 ?8.73 ?8.14 ?5.?? ?5.1? ?4.53 ?4.??								?8.8? ?9.1?	
		II	?9.51 ?9.?1 ?9.41 ?8.?4 ?4.?? ?5.?1 ?4.63 ?4.63								?9.0? ?0.00	
		III	?0.?? ?9.80 ?9.41 ?8.8? ?4.77 ?5.90 ?5.1? ?5.0?								?9.90 ?0.58	
		AVG	?9.57 ?. 15 ?9.?5 ?8.43 ?4.?5 ?5.44 ?4.7A ?4.AA								?9.?5 ?9.90	
7?A	1A??	I	?7.?A ?7.75 ?8.04 ?8.?4 ?7.07 ?4.19 ?4.8? ?4.43								?7.?A ?7.AA	
		II	?8.?4 ?8.?4 ?8.43 ?8.?4 ?7.?A ?4.48 ?5.1? ?4.63								?7.?A ?8.14	
		III	?9.1? ?9.?1 ?9.?1 ?9.?1 ?8.?4 ?7.17 ?5.70 ?5.??								?7.A5 ?8.14	
		AVG	?8.?7 ?8.43 ?8.A0 ?8.A0 ?7.59 ?4.A1 ?5.?1 ?4.79								?7.A6 ?7.91	
7?A	181A	I	?5.0? ?5.90 ?5.99 ?4.48 ?4.09 ?5.51 ?4.43 ?4.04								?5.70 ?5.80	
		II	?4.09 ?5.99 ?5.90 ?6.?9 ?5.99 ?5.70 ?4.63 ?4.?4								?5.41 ?5.90	
		III	?7.07 ?7.?A ?7.?A ?7.?A ?7.?A ?4.58 ?5.51 ?4.??								?5.99 ?6.19	
		AVG	?4.0A ?4.?8 ?4.4? ?4.71 ?6.45 ?5.?? ?4.86 ?4.40								?5.70 ?5.?A	
7?A	1957	I	?4.14 ?5.1? ?5.?1 ?5.70 ?4.09 ?5.99 ?5.?1 ?4.8?								?4.8? ?4.7?	
		II	?5.0? ?5.?1 ?5.?1 ?5.70 ?5.99 ?4.09 ?5.51 ?5.1?								?4.8? ?4.8?	
		III	?5.70 ?5.99 ?4.19 ?4.58 ?4.77 ?4.58 ?5.99 ?5.0?								?4.?? ?4.??	
		AVG	?4.?5 ?5.47 ?5.57 ?5.99 ?4.?9 ?4.?? ?5.A0 ?4.99								?4.8A ?4.8?	

APPENDIX J

PLOT 4 DIURNAL CYCLE DATA

J.1

REFLECTIVITY DATA

REFLECTIVITY MEASUREMENTS

POWER REFLECTION COEFFICIENT ρ

PLOT NO. 4, Diurnal Cycle

POLARIZATION: H
INCIDENCE ANGLE: 45°

FREQUENCY (GHz)

DATE	TIME	1.125	1.25	1.375	1.5	1.625	1.75	1.875
9/10	0635	.247	.253	.296	.309	.307	.299	.268
	0735	.251	.250	.276	.285	.274	.260	.231
	1000	.266	.276	.317	.355	.355	.343	.336
	1145	.271	.291	.341	.376	.376	.396	.394
	1400	.276	.289	.335	.363	.363	.345	.307
	1605	.292	.303	.335	.383	.385	.378	.339
	1800	.277	.286	.349	.385	.387	.380	.332
	2005	.218	.224	.269	.299	.304	.301	.289
	2230	.260	.273	.324	.353	.363	.359	.346
9/11	0705	.254	.263	.304	.320	.322	.322	.280
	1500	.299	.307	.366	.362	.335	.317	.272

FREQUENCY (GHz)

DATE	TIME	5.0	5.5	6.0	6.5	7.0	7.5
9/10	0630	3.35×10^{-2}	3.27×10^{-2}	2.47×10^{-2}	2.32×10^{-2}	2.10×10^{-2}	2.32×10^{-2}
	0730	3.35×10^{-2}	3.43×10^{-2}	3.57×10^{-2}	3.20×10^{-2}	2.20×10^{-2}	2.09×10^{-2}
	1005	2.99×10^{-2}	2.20×10^{-2}	1.98×10^{-2}	1.77×10^{-2}	1.08×10^{-2}	1.04×10^{-2}
	1145	2.25×10^{-2}	1.20×10^{-2}	6.43x10	4.17×10^{-3}	8.71×10^{-4}	2.79×10^{-3}
	1405	1.48×10^{-2}	9.13×10^{-3}	1.10×10^{-3}	9.55×10^{-3}	3.89×10^{-3}	5.56×10^{-3}
	1600	6.35×10^{-2}	7.08×10^{-2}	2.19×10^{-2}	2.62×10^{-2}	1.49×10^{-2}	1.12×10^{-2}
	1805	1.59×10^{-2}	8.32×10^{-3}	1.26×10^{-2}	1.37×10^{-2}	1.07×10^{-2}	8.56×10^{-3}
	2000	2.08×10^{-2}	1.68×10^{-2}	1.94×10^{-2}	1.85×10^{-2}	1.48×10^{-2}	1.53×10^{-2}
	2235	2.90×10^{-2}	2.09×10^{-2}	2.32×10^{-2}	2.35×10^{-2}	1.73×10^{-2}	1.32×10^{-2}
9/11	0700	5.32×10^{-2}	5.19×10^{-2}	5.34×10^{-2}	6.03×10^{-2}	5.10×10^{-2}	4.44×10^{-2}
	1505	1.68×10^{-2}	8.32×10^{-3}	8.09×10^{-3}	6.31×10^{-3}	6.81×10^{-3}	1.04×10^{-2}

J.2

GRAVIMETRIC MOISTURE DATA

SOIL MOISTURE MEASUREMENTS

GRAVIMETRIC MOISTURE CONTENT θ_w (GM/GM)

PLOT NO. 4, Diurnal Cycle

DATE	TIME	AREA	DEPTH INTERVAL (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/10	0630	E	.056	.119	.098	.174	.175	.188	.192
		W	.110	.174	.147	.188	.194	.213	.219
		AVG	.083	.146	.123	.181	.185	.201	.205
	0745	E	.034	.060	.041	.118	.169	.177	.189
		W	.031	.059	.091	.129	.176	.180	.198
		AVG	.032	.059	.066	.124	.173	.179	.193
	1000	E	.038	.127	.063	.163	.169	.178	.173
		W	.093	.176	.123	.191	.210	.208	.192
		AVG	.066	.151	.093	.177	.189	.193	.182
	1200	E	.050	.136	.085	.181	.186	.191	.206
		W	.097	.184	.122	.203	.202	.214	.213
		AVG	.074	.160	.103	.192	.194	.203	.209
	1400	E	.022	.133	.076	.169	.188	.194	.205
		W	.071	.168	.141	.187	.184	.196	.198
		AVG	.047	.150	.108	.178	.186	.195	.202
	1600	E	.008	.055	.013	.167	.180	.202	.199
		W	.028	.139	.064	.168	.188	.201	.215
		AVG	.018	.097	.039	.168	.184	.202	.207
	1800	E	.264	.156	.060	.186	.187	.200	.195
		W	.075	.145	.075	.170	.173	.197	.219
		AVG	.169	.150	.068	.178	.180	.198	.207
	2000	E	.044	.107	.067	.157	.180	.177	.222
		W	.054	.119	.062	.168	.194	.208	.201
		AVG	.049	.113	.065	.162	.187	.193	.211
	2245	E	.033	.077	.049	.162	.182	.212	.198
		W	.084	.114	.125	.184	.196	.188	.209
		AVG	.059	.096	.087	.173	.189	.200	.204
9/11	0715	E	.047	.093	.049	.143	.170	.204	.190
		W	.072	.132	.076	.192	.189	.213	.230
		AVG	.060	.112	.063	.168	.180	.209	.210
	1500	E	.018	.072	.022	.163	.179	.201	.200
		W	.066	.150	.102	.194	.204	.211	.180
		AVG	.042	.111	.062	.178	.191	.206	.190

J.3

VOLUMETRIC MOISTURE DATA

SOIL MOISTURE MEASUREMENTS

VOLUMETRIC MOISTURE CONTENT θ_v (CM^3/CM^3)

PLOT NO. 4, Diurnal Cycle

DATE	TIME	AREA	Depth Interval (CM)						
			0-½	½-1	0-1	1-2	2-5	5-9	9-15
9/10	0630	E	.088	.172	.146	.218	.202	.217	.228
		W	.171	.252	.220	.236	.223	.246	.260
		AVG	.130	.212	.183	.227	.213	.231	.244
	0745	E	.053	.087	.061	.148	.195	.204	.224
		W	.048	.086	.136	.162	.203	.208	.234
		AVG	.050	.086	.098	.155	.199	.206	.229
	1000	E	.060	.184	.094	.205	.195	.205	.205
		W	.146	.255	.183	.239	.242	.240	.227
		AVG	.103	.219	.139	.222	.218	.222	.216
	1200	E	.078	.198	.127	.226	.214	.220	.245
		W	.152	.267	.182	.254	.233	.247	.253
		AVG	.115	.233	.154	.240	.224	.234	.249
	1400	E	.035	.193	.114	.212	.217	.223	.244
		W	.111	.244	.210	.235	.212	.225	.235
		AVG	.073	.218	.162	.224	.215	.224	.240
	1600	E	.012	.080	.020	.210	.208	.233	.236
		W	.043	.202	.096	.211	.217	.232	.255
		AVG	.028	.141	.058	.210	.212	.232	.245
	1800	E	.412	.226	.090	.234	.216	.230	.232
		W	.117	.210	.112	.213	.200	.227	.260
		AVG	.265	.218	.101	.223	.208	.229	.246
	2000	E	.068	.155	.100	.197	.208	.204	.263
		W	.084	.173	.093	.210	.224	.240	.239
		AVG	.076	.164	.096	.204	.216	.222	.251
	2245	E	.052	.112	.073	.203	.210	.244	.235
		W	.131	.165	.187	.231	.226	.217	.248
		AVG	.092	.139	.130	.217	.218	.231	.242
9/11	0715	E	.074	.135	.073	.180	.196	.235	.225
		W	.113	.191	.114	.241	.218	.245	.274
		AVG	.093	.163	.093	.210	.207	.240	.249
	1500	E	.0277	.105	.034	.204	.207	.231	.237
		W	.103	.218	.152	.243	.235	.244	.212
		AVG	.065	.162	.093	.224	.221	.237	.225

J.4

AIR AND SOIL TEMPERATURE DATA

TEMPERATURE MEASUREMENTS FOR PLOT 4

			SOIL TEMP								AIR TEMP	
DATE	TIME	QUADRANT	1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	150 CM	30 CM
910	600	T	15.84	14.53	17.60	21.41	20.92	23.24	23.14	23.45	11.04	10.18
		TT	13.70	14.38	14.87	15.24	18.19	20.04	20.92	21.50	11.45	10.28
		TTT	15.55	14.14	14.92	18.28	19.45	20.53	22.38	22.48	10.87	10.28
		AVG	15.03	15.48	14.44	18.32	19.58	21.28	22.15	22.41	11.13	10.25
910	730	T	15.75	14.33	17.11	20.63	20.24	22.48	22.38	22.97	15.45	12.92
		TT	15.24	15.24	15.45	15.75	17.80	19.45	20.43	21.21	13.79	14.77
		TTT	15.45	14.14	14.72	17.89	19.24	20.43	22.29	22.77	14.04	14.92
		AVG	15.58	15.24	14.43	18.15	19.10	20.79	21.74	22.32	15.10	14.87
910	830	T	19.24	18.97	18.47	20.43	20.04	22.19	21.99	22.48	21.70	21.99
		TT	19.24	18.47	18.09	17.80	17.50	18.77	19.85	20.53	20.33	18.38
		TTT	15.94	15.84	14.53	17.11	18.19	19.24	21.11	21.70	21.31	21.89
		AVG	18.15	17.83	17.74	18.45	18.58	20.07	20.98	21.43	21.11	20.74
910	930	T	24.04	23.07	21.89	20.72	20.33	21.80	21.80	22.29	22.48	23.34
		TT	17.99	17.99	17.89	17.99	17.89	18.87	19.55	20.53	21.70	22.97
		TTT	20.43	19.55	19.24	18.77	18.97	19.55	21.31	21.80	23.55	23.85
		AVG	20.82	20.20	19.68	19.14	19.04	20.07	20.89	21.54	22.58	23.39

TEMPERATURE MEASUREMENTS FOR PLOT 4

			SOIL TEMP								AIR TEMP	
DATE	TIME	QUADRANT	1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	150 CM	30 CM
910	1039	T	28.53	24.97	25.51	21.31	21.50	21.80	21.40	22.19	25.99	24.68
		TT	23.14	21.31	20.72	20.24	18.38	18.87	19.75	20.14	25.21	24.63
		TTT	24.04	22.48	21.89	20.43	19.45	19.55	20.82	21.21	29.51	28.53
		AVG	25.25	23.45	22.71	20.66	19.85	20.07	20.72	21.18	24.90	24.61
910	1139	T	32.44	30.58	28.82	22.48	23.16	22.29	22.19	22.48	28.34	29.21
		TT	21.11	20.53	20.33	20.33	19.55	19.45	19.75	20.33	27.65	28.34
		TTT	27.75	24.38	25.12	22.97	21.60	20.82	21.11	21.50	32.24	30.19
		AVG	27.10	25.83	24.74	21.99	21.44	20.85	21.02	21.44	29.41	29.25
910	1239	T	35.97	33.12	31.24	23.85	24.73	22.48	22.48	22.48	30.29	31.07
		TT	21.40	21.11	20.72	20.92	19.94	19.65	20.04	20.43	29.21	30.68
		TTT	30.87	29.12	27.85	25.41	23.36	22.19	21.41	21.70	31.85	31.34
		AVG	29.25	27.78	26.61	23.39	22.68	21.44	21.31	21.54	30.45	31.04
910	1339	T	37.61	35.17	33.51	25.21	26.09	22.87	23.07	22.68	32.44	34.19
		TT	31.44	28.24	27.07	24.39	21.21	20.63	20.63	20.92	30.78	31.65
		TTT	32.63	31.07	29.61	27.46	25.41	23.94	22.58	22.48	31.65	31.46
		AVG	33.90	31.49	30.06	26.32	24.24	22.48	22.09	22.02	31.62	32.44

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
910	1439	I	37.80	35.54	34.39	34.09	37.44	33.24	33.44	32.48	31.54	32.14
		II	33.70	30.39	29.19	28.43	29.58	30.43	30.33	30.43	30.97	32.24
		III	31.45	30.97	30.00	28.53	34.29	34.43	32.29	32.19	30.09	31.85
		AVG	34.39	32.31	31.17	27.75	35.44	32.77	32.02	31.74	30.87	32.08
910	1539	I	37.90	34.34	35.34	37.54	39.41	34.33	34.73	33.55	32.53	35.34
		II	35.07	31.95	30.58	30.19	34.89	32.29	31.50	31.21	30.87	31.95
		III	31.54	31.17	30.78	29.70	37.75	34.19	33.75	33.24	29.51	30.87
		AVG	34.84	33.15	32.24	29.15	37.33	34.27	33.33	32.48	30.97	32.73
910	1439	I	34.24	35.75	35.27	38.43	30.58	35.41	35.80	34.43	33.02	34.05
		II	30.58	29.19	28.53	28.53	35.80	33.34	32.29	31.70	31.24	32.05
		III	31.45	31.44	30.97	29.90	38.24	34.87	34.73	34.24	30.78	30.87
		AVG	32.83	32.11	31.59	29.02	38.21	35.21	34.27	33.44	31.49	32.99
910	1749	I	33.02	33.41	33.41	29.41	30.87	34.09	34.58	35.19	30.78	30.48
		II	29.02	28.14	27.45	27.75	35.99	34.14	32.97	32.38	30.39	31.24
		III	30.48	30.29	30.09	29.80	38.73	37.54	35.51	35.02	29.80	30.39
		AVG	30.84	30.48	30.45	28.99	38.53	35.93	35.02	34.17	30.32	30.78

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
910	1839	T	29.31	30.58	31.17	29.31	30.19	24.48	24.97	25.60	24.48	24.48
		TT	25.80	25.90	25.80	25.99	25.51	24.14	23.14	22.48	24.58	24.87
		TTT	27.95	28.34	28.43	28.82	28.14	27.34	25.51	24.99	24.87	24.29
		AVG	27.69	28.27	28.47	28.04	27.95	25.99	25.21	24.33	24.71	24.55
910	1939	T	24.48	27.75	28.43	28.53	29.21	24.48	24.97	25.70	22.97	22.19
		TT	22.97	23.55	23.45	23.94	24.43	24.04	23.26	25.51	22.77	22.19
		TTT	25.02	25.80	24.29	27.17	27.24	24.87	25.51	24.99	22.29	21.89
		AVG	24.89	25.70	24.19	24.55	27.04	25.84	25.25	25.38	22.48	22.09
910	2039	T	24.82	25.80	24.48	27.85	28.04	24.58	24.77	25.80	21.40	20.24
		TT	21.21	21.99	22.09	22.48	23.75	23.55	23.26	22.48	21.40	20.24
		TTT	23.44	24.14	24.73	25.70	24.29	24.29	25.51	25.02	21.02	20.33
		AVG	23.14	23.98	24.50	25.34	24.03	25.47	25.18	24.50	21.41	20.27
910	2139	T	23.24	24.33	25.21	24.97	27.07	24.38	24.58	25.80	19.34	17.89
		TT	20.14	20.92	21.02	21.50	22.97	23.34	23.16	22.77	19.04	17.99
		TTT	22.19	22.87	23.34	24.43	25.41	25.70	25.41	25.02	18.47	18.09
		AVG	21.84	22.71	23.20	24.37	25.15	25.15	25.05	24.53	19.03	17.99

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
910	2230	T	22.09	23.14	23.94	24.38	24.19	24.09	24.99	25.70	20.24	17.21
		TT	19.14	19.94	20.14	20.53	22.38	22.97	22.97	22.77	19.55	18.38
		TTT	21.11	21.80	22.48	23.75	24.43	25.02	25.12	24.92	19.36	17.89
		AVG	20.79	21.63	22.35	23.55	24.40	24.49	24.79	24.44	19.71	17.83
910	2330	T	21.21	22.19	22.87	23.40	23.41	23.80	23.90	23.51	18.48	16.72
		TT	18.47	19.24	19.34	19.75	21.80	22.58	22.87	22.48	18.87	17.80
		TTT	20.43	21.11	21.80	22.97	23.85	24.43	24.92	24.73	18.87	18.09
		AVG	20.11	20.85	21.34	22.77	23.68	24.33	24.54	24.30	18.74	17.54
911	30	T	20.53	21.50	22.19	23.13	24.73	23.41	23.40	23.51	18.58	17.21
		TT	18.09	18.77	18.97	19.04	21.31	22.19	22.58	22.58	18.19	16.82
		TTT	19.75	20.53	21.21	22.29	23.24	23.94	24.43	24.43	18.38	17.31
		AVG	19.45	20.27	20.79	22.15	23.10	23.85	24.27	24.24	18.38	17.11
911	130	T	20.04	20.82	21.40	24.43	24.14	25.02	25.21	25.21	16.82	16.04
		TT	17.70	18.28	18.48	18.47	20.92	21.89	22.38	22.38	17.21	16.43
		TTT	19.34	20.04	20.53	21.40	22.77	23.55	24.33	24.43	16.82	16.43
		AVG	19.03	19.71	20.20	21.57	22.41	23.49	23.98	24.01	16.95	16.30

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
911	939	I	19.34	20.14	21.02	23.94	23.45	24.73	24.82	24.99	14.04	15.24
		II	17.21	17.89	18.09	18.28	20.43	21.40	22.19	22.29	14.43	15.34
		III	19.45	19.45	20.04	21.21	22.39	23.87	24.14	24.24	15.75	15.55
		AVG	18.74	19.16	19.71	21.15	22.19	23.33	23.72	23.81	14.07	15.39
911	939	I	18.87	19.75	20.53	23.55	23.07	24.53	24.43	24.73	14.14	15.04
		II	16.99	17.41	17.80	17.80	20.14	21.31	21.89	22.19	14.14	15.45
		III	19.48	19.04	19.45	20.53	21.89	22.48	23.75	24.04	14.04	15.45
		AVG	18.09	18.74	19.33	20.43	21.70	22.84	23.36	23.45	14.10	15.32
911	439	I	18.38	19.24	20.04	23.16	22.48	24.24	24.14	24.53	14.04	14.87
		II	16.42	17.11	17.31	17.70	19.75	21.09	21.70	21.99	15.84	14.77
		III	17.89	18.48	19.24	20.24	21.41	22.29	23.55	23.75	15.75	15.04
		AVG	17.43	18.28	18.87	20.37	21.28	22.51	23.13	23.42	15.88	14.90
911	539	I	17.99	18.77	19.55	22.48	22.29	23.94	23.85	24.24	15.04	14.38
		II	16.23	16.82	17.01	17.41	19.45	20.82	21.50	21.89	15.04	14.47
		III	17.50	18.19	18.77	19.94	21.02	21.89	23.24	23.45	14.97	14.47
		AVG	17.24	17.93	18.45	20.01	20.92	22.22	22.87	23.24	15.03	14.57

TEMPERATURE MEASUREMENTS FOR PLOT 4

DATE	TIME	QUADRANT	SOIL TEMP 1 CM	2 CM	3 CM	5 CM	10 CM	15 CM	24 CM	30 CM	AIR TEMP 150 CM	30 CM
911	739	I	17.11	17.70	18.58	21.70	21.21	22.97	22.87	23.24	13.89	13.01
		II	15.75	16.14	16.33	16.89	18.87	20.33	21.09	21.41	14.57	13.79
		III	16.89	17.41	17.89	19.34	20.33	21.21	22.48	22.97	14.38	13.79
		AVG	16.58	17.08	17.60	19.29	20.14	21.50	22.19	22.55	14.25	13.53
911	739	I	17.50	17.99	18.48	21.50	21.09	22.97	22.97	23.34	15.94	15.34
		II	16.72	17.01	17.01	17.21	18.77	20.14	20.89	21.41	15.55	15.84
		III	17.50	17.80	18.38	19.34	20.24	21.11	22.48	22.77	16.43	16.62
		AVG	17.24	17.60	17.93	19.32	20.01	21.41	22.15	22.51	15.97	15.94